

# The Mining And Metallurgical Journal

VOL. XVIII. NO. 7

LOS ANGELES, CAL.,

January 1, 1898,

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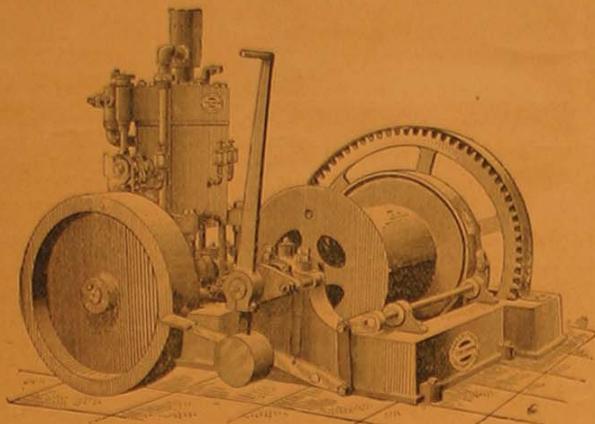
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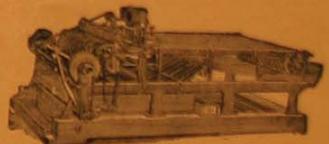
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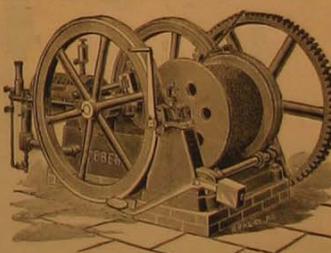
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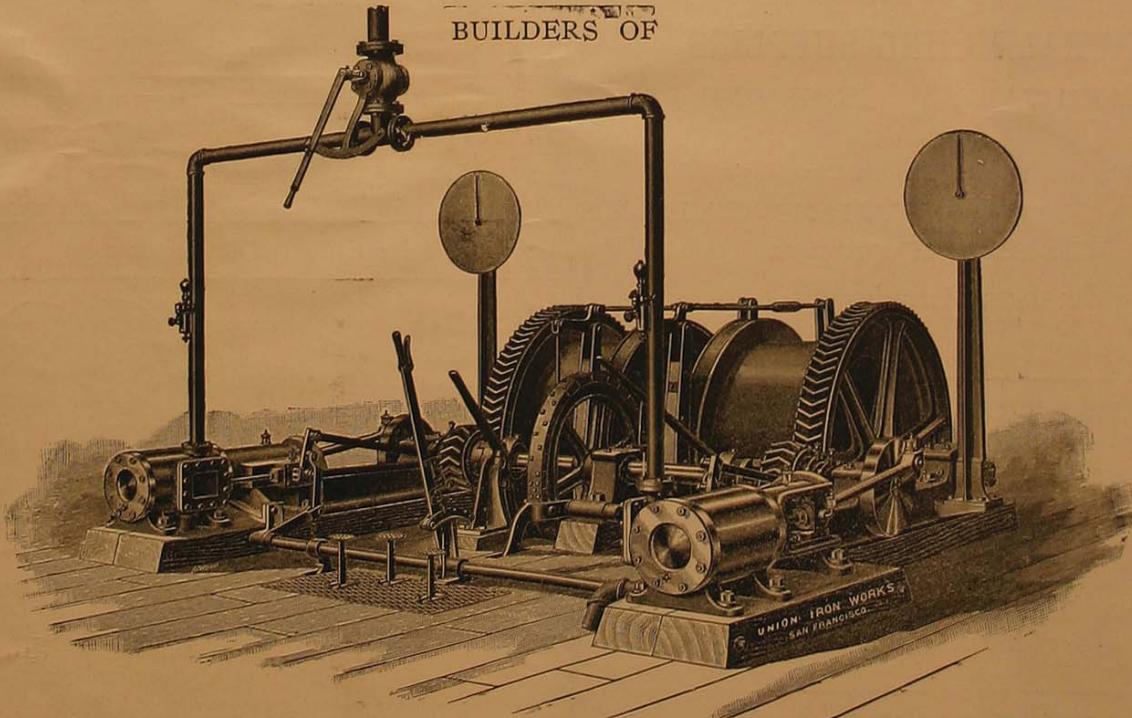
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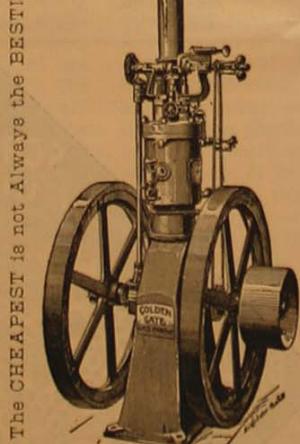
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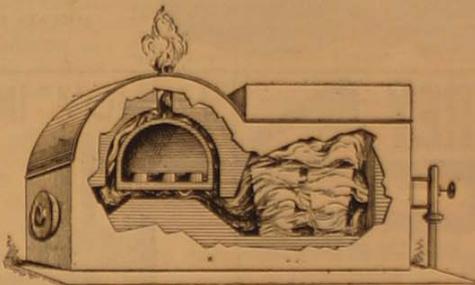
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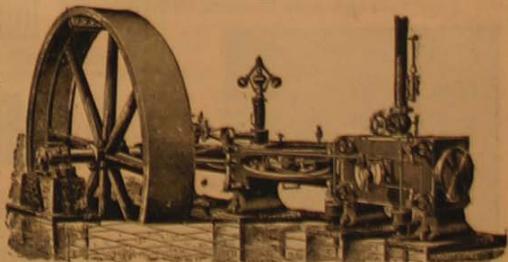
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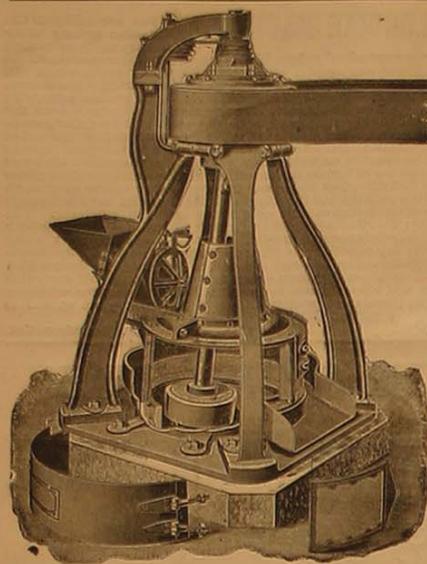
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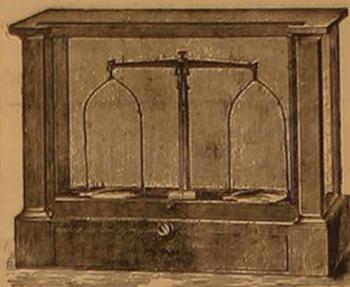
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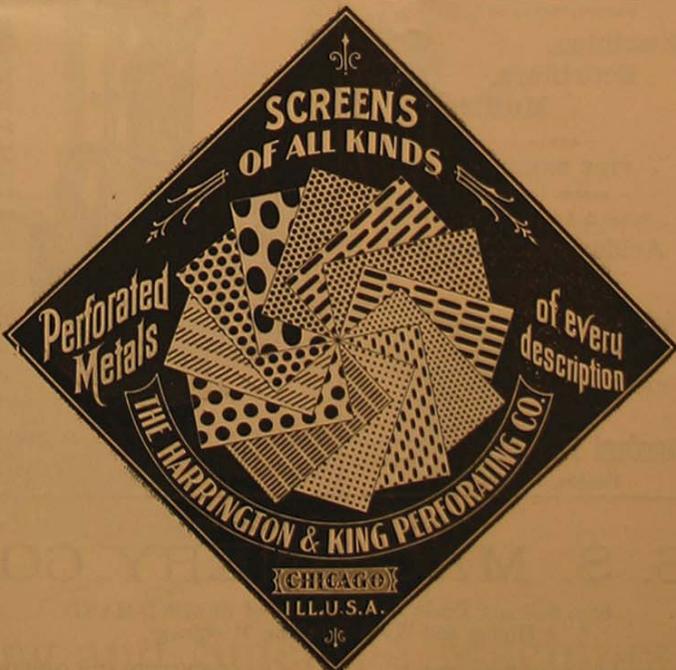
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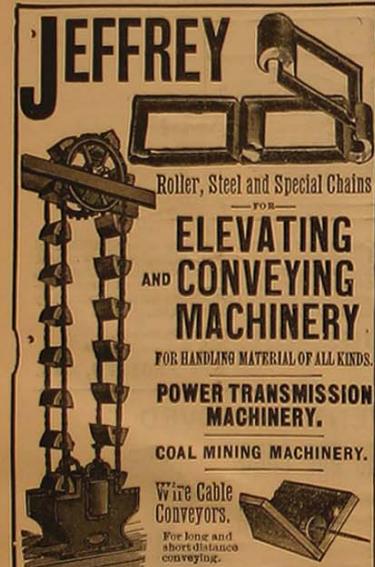
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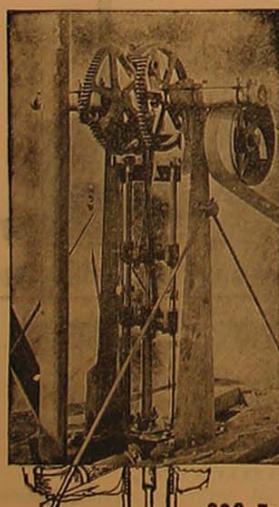
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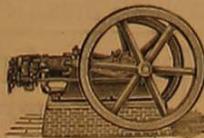
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#### THE PROSPECT STAGE OF MINING.

In the western United States the new discovery or claim on which a mineral find of economic value has been made is generally termed a prospect. Such a claim is an embryo mine in the as yet speculative stage of its career. In rare instances however, claims have been found which show a sufficiently large surface exposure or outcrop of workable quality and quantity on the surface, without much work on the deposit of ore being done to give it the value, which the aid of natural favorable local conditions only have given it a commercial standing. In the very large majority of cases however, mining work to a greater or less extent has to be done, to demonstrate value and locate the pay shoots of ore on the vein or deposit. The expenditure of capital in this work constitutes the speculative stage of mining, both in a lineal direction along the strike and across the width of the vein, and also by sinking on it in depth, or by tunneling into a hill to cut it in depth. In these operations, in these operations, the industrious prospector who understands his business, and can grasp the geological conditions and environment of the claim, can save much labor, time, and capital in arriving at the true value of his discovery.

The ability to discover minerals of value is the first requirement of the prospector; but the knowledge and experience to develop them, with the least amount of trouble and expense, is his second and most important qualification, and one which is gained only after years of experience in such work, hence it is that the old miner makes the best prospector.

The recent revival of the mining industry, coming at a time when other lines of trade were suffering from depression and dull times,

has had the effect of attracting many who were not miners to the work of prospecting for gold mines, hence the necessity of these remarks for the benefit of those who do not realize the difference between a mine and a prospect. It is during the prospect stage of mining that the speculative element of the business is now almost confined.

The prospector having located the pay streak along his ledge on the surface, and tested his extent of ore in depth, by sinking shafts, cross cutting, and driving levels, is generally by the aid of such work in the position to know what he has got, and to calculate value and take out ore. When conditions have arrived at that point, the speculative prospect has passed into the condition of a mine, and by keeping the development work in advance of the business of extracting pay ore, the risk and speculation ceases, and the enterprise is a commercial undertaking.

The desire of capital to purchase only claims showing ore in sight, with shafts and levels opened, and the large increase in recent years of the mining industry in all countries, have tended to bring about this condition, so that risk and speculation in mining is now largely confined to the prospecting for minerals.

#### PROSPECTS AND MINES.

The evolution of a prospect into the condition of a producing mine is generally a slow operation, requiring much preliminary testing of ore and work to ascertain value, and open the deposit to show extent of ore in sight, and to admit of the employment of a force of miners in stoping or extracting the pay ore.

The best rule which can be laid down to determine when a prospect has changed into the condition of a mine, is its ability to produce ore in paying quantity, and have sufficient development work done, or ahead of the stoping ground, so that each class of miners are not in the way or retarding the work of the others not similarly engaged. The first fifty feet, or even one hundred feet in some cases, of the surface of the vein or deposit, ought to be left untouched, to support the surface and keep out water, and is always ore available, if the mine should become exhausted. The hand to mouth system of working a mine, when there is no ore blocked out ready for stoping, keeps that mine in the prospect and consequently speculative stage of development. Ore reserves in the stopes of a mine are the stock in trade of the thrifty miner. The necessity for development work to be carried on, by sinking shafts and driving levels to locate new ore bodies or pay shoots, before the ore at present being worked becomes exhausted, keeps the mine out of the speculative and uncertain condition, and reduces mining to a commercial enterprise of extracting the raw material and placing it on the market. Even in the case of large surface exposures of ores such as iron, copper, and large low grade gold ore deposits, the prospect stage often requires a large amount of work to be done to ascertain quality and value, and to prepare for the active operations of mining on a large scale. The future value and extent of a vein or deposit are unknown quantities, and it is the first duty of the manager and owners to ascertain these all-important facts as far in advance as means on hand will permit, even if it is at the sacrifice of a delay in declaring a dividend. The development of new stopes of ore is the best

bank into which a mine owner can put his capital, and the neglect of it has brought ruin to many a mining enterprise. An unlimited supply of ore beyond present needs makes mining a sure and safe investment.

#### THE SQUARE MINING LOCATION.

At this time when there is agitation by a few parties only, at mining association meetings throughout the different States for amendments to our present mining law, the chief outcry is against the most just provision of our present apex law which allows the miner to follow the dip of his vein or deposit by continuous work underground on the same vein or deposit to an indefinite depth towards the center of the earth. By these theoretical miners and would-be Doctors of Law, the contention is advanced that the cure-all exists in substituting a square location of large area with vertical side boundaries as is practiced in the Eastern States, in place of the present parallelogram of 600x1500 feet with the right to follow the dip. Under both forms of patenting mining claims the error arises in our government ceasing to control the mining industry for the benefit of future and adjoining owners, and in the interests of capital invested in deep mining operations.

Dr. A. M. Raymond says on this subject when reviewing: "The Ontario Mining Act, as framed in 1892, seems to me to embody a very judicious attempt to continue the encouragement of exploration and mining with the retention of sovereign control and supervision. It \* \* \* grants and regulates the rights and privileges of mining." But he ought to have added that it is only a half measure of justice to the miner, as half the minerals of that country have passed into private control prior to the passing of the act. In early times in the Province of Ontario the minerals were reserved (the same as in early times in the United States) in patenting land, but a Conservative government who conserve nothing except to themselves, departed from the just provision for aid to the miner, and subsequent administrations have done the same, hence the above remark.

Under our present system in the western states when dispute arises, recourse is had to courts of law in place of being settled by arbitration by mining men conversant with the conditions and justice of the case, hence the evil of our present system. This evil does not exist in the form of our mining claims, or in prosecuting deep mining by following the dip by continuous work, but wholly in our wrong manner of administering justice in mining disputes, and in having recourse to courts of law and lawyers to settle them, whose business it is to carry the case along for all there is in it. On this subject see our issue of 15th November last on "Mining Disputes in Law Courts."

The chief objection to the square location of large area is that it covers and monopolizes more veins or deposits than the ore body for which it is granted. This condition is due to the parallel mode of occurrence of mineral veins and deposits, both of the same mineral for which the claim is granted, and of different ores of other minerals which lie parallel to it, in nearly all mining districts. For that reason it is not as just a law as our United States western mining claim location on Federal lands. The vertical side line boundaries of the square location in countries where roads and concession lines run, cause a change of ownership to the minerals which capital

has developed, and are a preventive to deep mining when the deposit dips, and a condition which is not in the interests of capital invested in mines. The square form of survey is a good surface boundary for land areas, but not a good mining claim condition, and to adopt it in the western states would be a step against the best interests of the mining industry in almost all sections except for minerals such as coal areas, where the mineral is found in the float or horizontal position. The abandoned mines of the eastern states where the deposit dipped into an adjoining property, are lasting monuments of the injustice done to capital invested in eastern mines under the square location. They show the necessity of the contention that mineral ownership is, or ought to be, separate and apart from surface conditions and laws, and that the mining industry in all states of the Union requires government inspection and careful supervision to attain the best results in the interests of labor and capital invested in mines.

#### THE ORES OF ALUMINUM.

In a recent issue the *Canadian Mining Review*, which is the leading mining paper in Canada, prints the following remarks *en passant*. It is, however, worthy of more than a passing glance, as the mistake of supposing that any mineral rich in aluminum is a suitable ore of aluminum is a common error.

"A remarkable bed of pure white clay has been discovered some twenty miles north of Christina lake, on McCrae creek in British Columbia. The deposit is quite extensive, running for 1,300 feet on the surface, and it is known to have a depth of over twelve feet. Assays made by the Pratt-Fairfawl Co. of Northport, and E. B. Van Osdel of Spokane, Wash., show it to be extraordinarily rich alumina, running from 31.2 to 43 per cent, which would be equivalent to \$165 to \$185 per ton of pure aluminum. The locators, Messrs. Latta, Teale and others, are now in communication with some of the aluminum works in the east to have its commercial value fully determined."

From the description given and the analyses quoted the material apparently is a high grade pottery clay worth say \$5 a ton, if within reach of transportation facilities and when landed at a commercial point such as Vancouver. As an aluminum ore it is valueless, as silicates of alumina are not at present available as a source of aluminum by the ordinary electric process. The reason of this is that the silica as well as the alumina is reduced in the electric furnace, and consequently only substances free from silica and holding a workable percentage of aluminum are admissible under present conditions of the electro-metallurgy of aluminum. The only mineral used at present for this purpose is the Greenland spar or cryolite of the composition  $3 \text{NaF} - \text{Al}_2\text{F}_3$  — aluminum 13.0, sodium 32.8, fluorine 54.2 = 100.0. It is found in a bay in Arksut fiord, in West Greenland at Enigtoq about twelve miles from the Danish settlement of Arksut, where it constitutes a large bed or vein in gneiss, and contains galenite, sphalerite, siderite, pyrite, arsene-pyrite, fluorite, columbite, cassiterite all often in fine crystals. Its colors are snow-white sometimes reddish or brownish to brick-red and even black. Sub-transparent — translucent and brittle, more transparent when wet. It is shipped to Europe and to Pennsylvania and used as a source of sodium and aluminum in the manufacture of salts of these metals

and of recent years as an ore for obtaining metallic aluminum by the electric process. The value of this interesting mineral and the difficulty and expense of obtaining it from Greenland ought to stimulate prospectors operating in the Archaen or Laurentian rocks of the United States and Canada in the search for it. As it will melt in the flame of a candle it is easily distinguished from other minerals.

At the Metcalf gold mine in San Bernardino county, Cal., a natural alum is found associated with quartz and iron pyrites and being soluble in water it might be recrystallized and used as a source of alum or of metallic aluminum. The occurrence is interesting to mineralogists as a vein matter associated with gold ore apart from any commercial value it may represent.

#### THE WORLD'S GREAT BANKS.

Nearly every European nation has a bank which is not exactly a part of the government but an adjunct or aid. The bank manages the nation's finances but is nevertheless under control of the legislative and administrative branches of the government. Of course the functions of the bank are prescribed by law, and it receives direction from the fiscal office of the state from time to time.

There are four great banks, the state Bank of Russia, which has on the average a gold reserve of \$480,000,000; the Bank of France, with a gold reserve of \$330,000,000; the Bank of Germany, whose gold reserve is \$185,000,000, and the Bank of England, with a gold reserve of \$135,000,000. The reserves necessarily fluctuate to some extent, but the managers check withdrawals by raising the rates of interest and exchange, whenever the reserves are in danger of running below what is desirable.

The Bank of France also has a reserve in silver to the amount of \$225,000,000, and it divides withdrawals between the two classes so as to preserve a substantial equilibrium. The metal money of France is \$800,000,000 gold and \$700,000,000 silver. The Bank of Germany also holds a silver reserve of \$100,000,000, and resorts to practices similar to those of the Bank of France to preserve a certain quantitative relation between the two classes of reserves.

The gold reserves of these four great banks comprise about one-third of all the gold of the world devoted to monetary uses. They supply their respective countries with all paper circulation, and are required to redeem it with metal money. They are the great factors in European financial affairs. However, in many respects the Bank of England is less potential than the great banking house of the Rothschilds. In emergencies the state banks support their respective governments with all their resources.

#### THE MONETARY PROGRAM OF SECRETARY GAGE.

The JOURNAL is not a party paper, but it is deemed proper to convey information that directly affects the mining industry and the business of the country. Every financial measure has its influence upon both. On this subject there are radically different theories, and the bill which Secretary Gage has caused to be placed before the Committee on Banking and Currency of the House of Representatives reflects the views of one extreme.

Mr. Gage is frank in stating that the object of his bill is to commit the government more thoroughly to the gold standard, and we perceive it will have that effect if enacted and faithfully executed. It authorizes the Secretary of the Treasury to issue a new series of bonds bearing  $2\frac{1}{2}$  per cent interest, and payable, principal and interest, in gold coin, to take up the series of bonds falling due in 1904 and 1907, which bear interest at 5 and 3 per cent respectively, payable in coin. The laws which authorized the issue of these two series do not confer the power on the Secretary of the Treasury to stipulate otherwise than to pay in coin, though the practice has been invariable to pay in gold coin. If the bill becomes a law the government will be explicitly committed to the issue of bonds only which are payable in gold coin.

The other feature of the bill relates to dealing with the question of currency. It provides somewhat elaborately for the ultimate retirement of the United States notes, treasury notes issued under the act of 1890, and the silver certificates. The gold certificates are left untouched. The scheme is to deprive the government of the power to issue paper circulation, and to confer it exclusively upon the National banks. The banks are allowed to deposit bonds, as they now are, with the treasury as security to the government for guaranteeing their notes, and on which they can receive circulation to the full face of their deposited bonds. Another provision allows them to deposit United States notes, treasury notes and silver certificates and receive circulation from the Controller of the Currency to the extent of the face value of such deposits. In addition they may issue notes in excess of their deposited securities, bonds and others, when such securities equal fifty per cent of their capital, and for guaranteeing such excess the government is to be protected by being made a creditor with first privilege on the assets of the bank.

The aggregate of the circulation issued to the banks, except upon that issued on deposited bonds, is limited to \$200,000,000. United States notes, treasury notes and silver certificates aggregate about \$600,000,000, and deducting the \$200,000,000 leaves \$400,000,000 to be retired in some other way, which is not provided for in the bill. The presumption is that they are to be retired by the issue of gold bonds or by cancellation when taken in as rapidly as the excess of revenue over expenditure will permit. Under the Dingley law there has thus far been a deficit, and no one confidently predicts a surplus in the future, hence it is possible that retirement by bond issues is in contemplation. Mr. Gage states the present bill is to be supplemented by another, the precise character of which has not been indicated.

The bill, so far as it goes, does commit the government to the gold standard, and if enacted there will be no legal tender money except gold, though until existing laws are repealed silver dollars will retain that quality. It will be observed that the bill makes no provision for enlargement of the money volume to supply the exigencies of increasing population, production and commerce, except through gold coinage and of subsidiary silver coin, and the will and pleasure of the banks, to which is confided sole power to control and regulate the volume of paper money. The bill is likely to be stubbornly resisted by the friends of silver and those who fear danger from conferring a power so great and exclusive upon the banks.

**Self Tightening Cam.**

We are pleased to call the attention of the mining public to the latest and certainly a very meritorious improvement in the construction of stamp mills, which Messrs. Fraser & Chalmers, of Chicago, Ill., have just placed upon the market.

The "new" Blanton Cam needs only to be understood to be appreciated. The practical mill manager is astonished at its simplicity and pleased with the results. A cam held securely to the cam shaft without keys or loose parts of any kind is certainly a novelty. The cam and the shaft are the only parts

It will be observed that this tightening takes place over the entire circumference of the shaft, thus equalizing the stress in the hub of the cam. At the same time there cannot be more stress than is absolutely necessary to do the work, thus avoiding all undue strains incident to driving keys, etc.

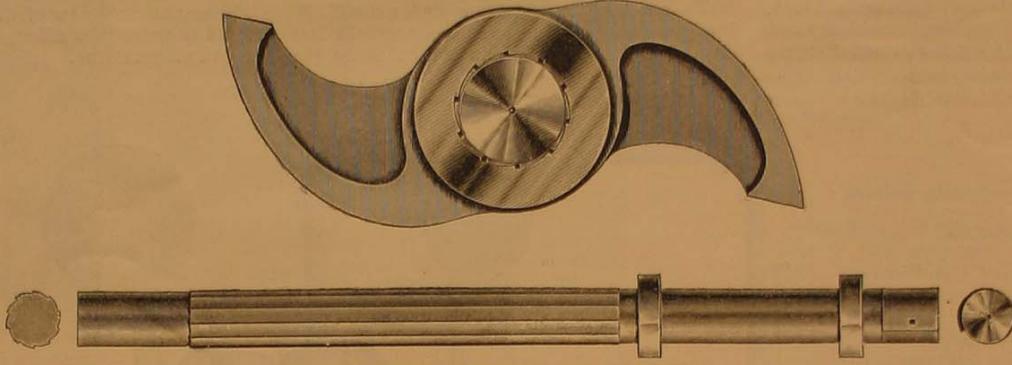
When necessary to take off a cam, a slight blow on the back edge with a hammer loosens it instantly.

The cams are duplicates and interchangeable, so that they may as before explained be used in any position.

NOTE.—The Blanton fastening can be used for line shafting and many other purposes.

Among the large belts recently manufactured by Mr. Degen is one 40 inches wide and 80 feet long for the Buckeye Mills of Marysville, Cal.; one 30 inches wide and 130 feet long for the Crown Mills of Stockton; one 24 inches wide and 100 feet long for Hobbs, Wall & Co's new box factory, besides all the smaller belts.

The Horse Shoe Brand Lace supplied by Mr. Degen is pure fulled rawhide made from the best slaughter hides and by the latest and most improved methods. It is unexcelled for evenness, softness, strength and finish. It is free from cuts, brands and grubs, will remain soft and pliable in all climates, and age does



used in this peculiar fastening, which is explained by reference to the accompanying cuts.

The fastening in this case has ten taper faces, equally divided so as to distribute the cams properly to make five or ten drops of the stamps as the case may be. The section of cam shaft where cam is secured is the same, whether for five or ten stamps. The ten taper faces on the shafts, and the corresponding faces in the bore of the cams, are made with mathematical precision by machinery specially designed for the purpose, thus insuring the proper fit and division of the cams on the shaft.

**A Leather Belting Factory.**

One of the most attractive displays at the Mechanics' Fair held in San Francisco was that of L. P. Degen, manufacturer of leather belting, whose factory is located at 105-107 Mission street, San Francisco.

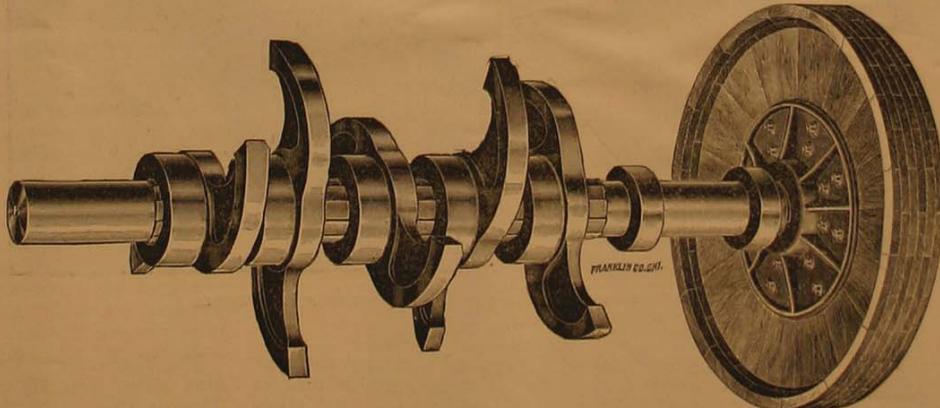
This factory was established twenty-one years ago, and is the leading belting factory on this coast, having had an uninterrupted career of prosperity from the beginning.

The more modern machinery, with the very latest improvements, is used in the manufacture of the leather belting, the best grade of

not affect it. It costs no more than ordinary lace and is superior to all others.

At the State Fair, held in Sacramento in 1890, the belting made at this factory was awarded a silver medal; in 1891 the Star Brand Belting was awarded a silver medal and the Rawhide Lace Leather a diploma; in 1893 the highest reward was given by the Midwinter Fair, while at the last Mechanics' Fair the exhibit was awarded a diploma for the best oak tanned leather belting.

The exhibit this year was devoted to the display of the many lines of leather goods that are manufactured. Forming at attract-



Although the cams will be located and marked to correspond with our standard drop, the mill superintendent can arrange the cams for any drop he may prefer, without the slightest alteration, either of cams or shaft.

The great advantage of this fastening is in the convenience which it obtains in erection and operation of the cams. It is only necessary to place them on the shaft at their respective positions, and tighten on the taper faces to hold them in position until put into operation, when they will tighten themselves further on the shaft in proportion to the amount of work they have to do.

which is known as the Star Brand, being made from carefully selected steer hides, thoroughly stretched, well cemented and riveted, coated with waterproof dressing and guaranteed to run perfectly true.

Dynamo belting receives special attention. All of this is made entirely from the centers or solid parts of the leather, and treated with a composition which fills the pores completely and adds very much to the strength, making it more pliable, and at the same time leaving it firm and less liable to stretch. This is of vital importance to swift and steady running machinery, especially dynamos.

ive background to the booth is an immense hide which was the largest in California, while in the foreground were seen oak tanned and round leather belting, rawhide rope and various kinds of belt fasteners. With the main display were some of the attachments used in placing a belt in running order. Wire lacings, electric belt dressing, round belt couplings and fulled rawhide lacing of this character and made an attractive addition. The display in general did justice to the artistic arrangement made under Mr. Degen's supervision, and added luster to the already excellent reputation of that house.

### The Oneida Hoist.

We publish herewith an illustration of the direct-acting steam hoist, erected upon the Oneida mine, near Jackson, Amador county, California, by the Union Iron Works of San Francisco, whose works have been established on the Pacific Coast since the year 1849. Their progress and prosperity may be noted by the steady growth from a small shop until today it is the largest and best equipped plant of its kind in the United States.

As their manufacture of mining and metallurgical machinery dates back to the earliest mining in California, their experience, as a natural result, has been extensive; but it is not limited to the state of California alone, for their mining and milling machinery can be found in all the mining camps and districts

One of our readers, Mr. J. Q. McKinney of Garlock, Kern county, Calif., submits the following question:

"Will you please inform me about the location law containing the following proposition: 'A.' locates a claim in 1895, fails to do the work in 1896. 'B.' locates the same property Dec. 1896, and does the annual assessment work. 'C.' locates the property in January, 1897, and does the assessment work. All locations were duly recorded. To whom does the claim belong?"

ANS.—A mining location properly made is as much a segregation of the public domain as any kind of a location of agricultural lands, and "A." would have under the U. S. law governing mining locations, until the last day of December, 1896, in which to do the

lature of the State of California, there was no statute requiring notice of mining locations to be recorded. Unless the district rules, the local customs of miners, or the state or territorial statute requires such notice to be recorded, it is not essential to the validity of a location that it should be recorded.

#### Vide:

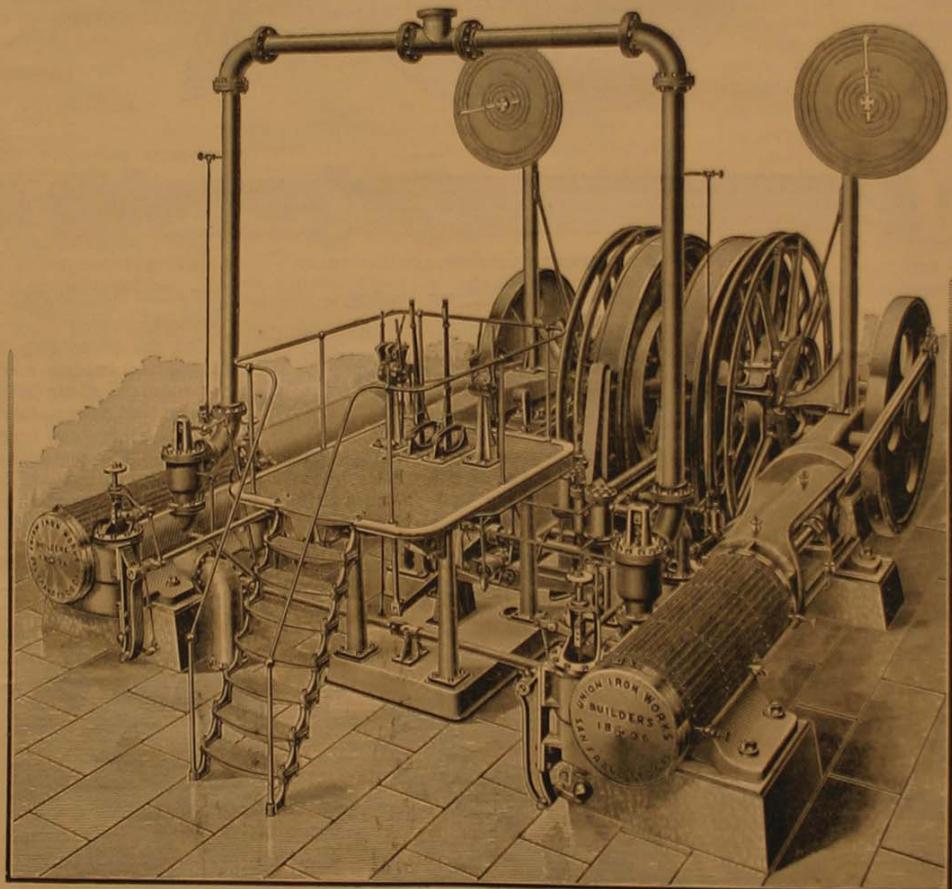
Thompson vs. Spray. 72 Cal. 528.

Golden Fleece Co. vs. Cable Co. 12 Nevada 323.

So. Cross Co. vs. Europa Co. 15 Nevada 384.

Jupiter Co. vs. Bodie Co. 7 Sawyer 114.

Since the new law of this state above referred to went into effect, it is necessary to record all locations.



HOIST ERECTED ON THE ONEIDA MINE NEAR JACKSON, CALIFORNIA

of America, Alaska, Mexico, Central and South America, Australia and Africa; thus, from their experience and facilities, they are in a position to produce the finest class of work with the greatest precision and dispatch.

This hoist is in successful operation sinking the shaft, which is expected to go about 2000 feet before cutting the lode.

The cylinder is 20x60, and the power of the hoist is 500 horse power, which is the largest direct-acting steam hoist erected on any mine in California at the present time. Self-acting dumping skips, having a capacity of two (2) tons, are hoisted at a speed that would not seem possible. The hoist is perfect in its operation and is giving splendid satisfaction.

assessment work required, and any entry or location upon his claim during this time is absolutely void, *ab initio*, and "B." takes nothing by his location—or work performed—and there being no privity between "A." and "B." in regard to the work done on the claim by "B." "A." cannot benefit by it—and "A." himself having failed to do the work or procure it to be done, his claim is open to location in January, 1897. "C.," who has a valid location if properly made in January, 1897, has until Dec. 31st, 1898, inclusive, in which to perform the annual assessment work required.

With reference to the location notices of "A.," "B." and "C.," "having been recorded," we will say that prior to the passage of the act of March 27th, 1897, by the Legis-

The discoverer of the famous Drum Luminon mine, near Helena, Montana, was Mr. Thomas Cruse. In the days before he sold his property and returned to Helena a much honored millionaire, Mr. Cruse was locally known as "Old Tommy," and was looked upon as a somewhat visionary character. None questioned after a time that his mine, where he lived and labored alone, was valuable, but few placed its worth so high as did the patient owner. When he refused half a million for his claim, the people of Helena called him foolish, and when he turned away from the offer of a million, they called him a fool. But the miner was wiser than his friends, and eventually received his price, \$11,500,000, and a goodly number of shares in the new company.

The loader is manufactured by the California Wire Works, whose office is at 330 Market street, San Francisco, California.

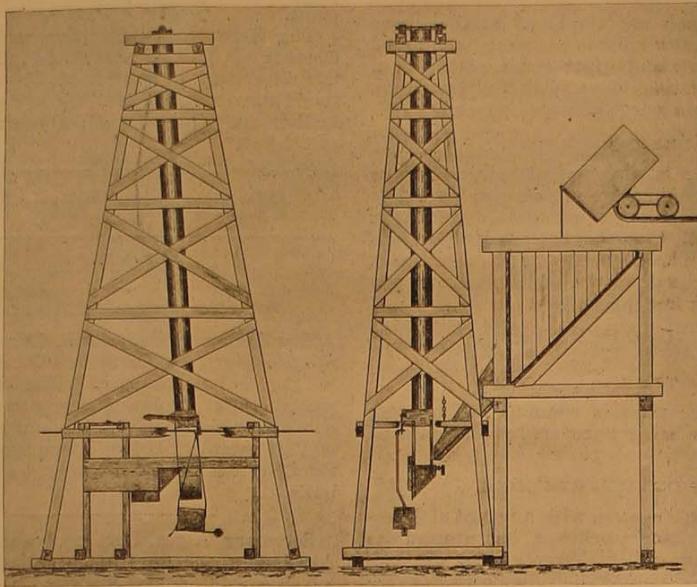


FIGURE 2

FIGURE 1

#### Mechanical Loader for Wire Ropeways and Tramways.

We illustrate one of the latest patents of A. S. Hallidie, of San Francisco, California, which is a device for loading the carriers of wire trams and ropeways.

Figure 1 is a side view of the loader, showing the ore bin, the chute, the pendulum with the loading box at its lower end and the ore carrier.

Figure 2 is a front view of the same, showing the pendulum and the loading box swung out from its resting place having discharged its contents into the carrier.

Figure 3 is an enlarged view of the lower part of figure 2, in which the essential parts are shown more in detail.

The apparatus is exceedingly simple and efficient and with the aid of one man can easily load 300 tons in 12 hours. There is nothing to get out of order and very little to wear out. It is placed in front of the ore bin from the chute whence it is discharged into a loader box at the foot of the pendulum.

The device consists substantially of a pendulum swinging on trunnions about 16 feet above the level of the moving cable. The pendulum is made from No. 16 sheet iron tubing 12 inches in diameter. At the lower end is attached a loading box which contains, when loaded, enough ore to fill one carrier of the ropeway. The loader box has two sides, a back and a sloping bottom; the front of the box is open. With an open front the ore dumped in would, of course, slide out immediately, but while the box is being loaded it is held between a guide and a fixed partition or bulkhead. The ore is thus held in a stationary position by a hooked latch which forms part of a tripping device consisting of a lever working on a fulcrum, and will be held there until the latch is released from its keeper.

The releasing of the loading box is done by the clip on the moving ropeway cable to which the ore carrier is suspended, and which as it moves along, strikes the end of the lever and raises the latch. This releases the loading box. At the time the loading box is re-

leased the ore carrier is immediately under the nose of the loading box ready to receive the contents of the box. The clip on the moving cable pushes the pendulum along in the direction of the travel of the cable and out from the partition and thus opens up the front of the loader box and lets the contents pour into the carrier. Both the loader box and ore carrier move together at the same speed for a sufficient distance to allow the ore to be discharged from the loader box into the ore carrier. The swing of the pendulum raises it sufficiently high to clear the rope clip and the pendulum with its loader box swings back in between the guide and the bulkhead ready to receive another load of ore from the ore bin.

#### Next Meeting of Mining Engineers.

The twenty-eighth annual meeting of the American Institute of Mining Engineers will be held at Atlantic City, N. J., beginning February 15, 1898.

Ample opportunity will be given at this meeting for the presentation and discussion of papers—which is all the more desirable, because the late Lake Superior meeting was so largely occupied with excursions and entertainments that the professional sessions were necessarily curtailed.

The Institute has under advisement a meeting in Mexico next October. It will be arranged if enough members express an intention to attend.

#### Mining Directory for 1898.

Poole Bros., of Chicago, are preparing their "Mining Directory and Reference Book for 1898." This will be a valuable work containing the corporation, lien laws and mining codes of the states, territories and provinces. The directory will contain a great amount of statistical information useful to mining men and manufacturers of mining machinery.

We have received information as to the Fulton power head, one of the most simple pumps on the market. It was invented by A. T. Ames of Galt, Cal., and is a great improvement over the other old ones, as you only need to slip off a cover and all the parts are then exposed to view, which does away with sending for machine workmen to repair it. It only takes a few minutes to do this and then it will flow as good as ever. It is so constructed that it will never freeze or burst, and altogether it is considered one of the finest of the kind in existence. The works and factory are at Galt, California.

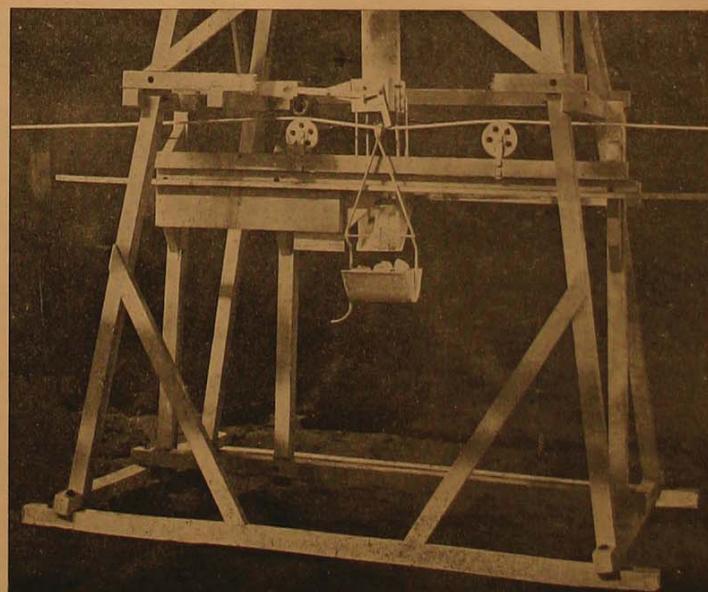


FIGURE 3

## CORRESPONDENCE

## CALIFORNIA

TUOLUMNE MINES.  
(From Our Special Correspondent)

## Mother Lode.

## THE ARBONA, TUTTLETON.

Main shaft now sunk 230 feet. Crosscut tunnel, or adit level, was driven 200 feet when main vein was intersected, from this point a raise was put up to surface, which constituted main shaft, being of two compartments, distance from adit to grass 180 feet, then sinking was resumed—a station being cut out at point of intersection, with vein in the adit level—shaft continued downwards. The vein at all points between walls, so far as opened up, shows a 7 feet vein, which mills on an average of \$7.50 to \$8.00 a ton. The rock shows free gold, the sulphurets are of high grade, assaying in places \$700 per ton. There are several levels run on the vein, north and south, aggregating 250 feet in each level exploited. The vein is found of uniform size—walls perfect.

The mill of 10-stamps has started up, the past rains affording the supply needed; the same will be kept continuously crushing on the rock that has accumulated in the ore bins and mines. There will be at times sufficient quartz to keep the 10 stamp mill fully employed, very shortly 10 more stamps will be added as the mine becomes opened up; such a course will be expedient and necessary.

## THE RAWHIDE.

The above mine is now sunk to a depth of 1300 feet. The deeper the explorations are conducted the higher the value of the ore—drifting on this, the deepest part, proves the value of the assertion.

## THE GREENHORN MINE

Is found to the east of Tarantula, has a good sized vein, with paid values. It is now being under purchase consideration and will shortly change hands.

## THE TARANTULA.

The steam hoist at the Tarantula is nearly completed. It is a very perfect double cylinder hoist. The boiler is all nicely set in brick and the engine in concrete, and they expect to put in a cable in a day or two.

## THE ALAMEDA.

The more this mine is developed the better is the showing. Drifting on the 500 feet level is still the order of the day; payable rock is daily brought to grass, that when a mill is built there will be large amounts of quartz ready for crushing, with a continuous supply for a 20-stamp mill. The sulphurets are of very high grade, containing a very heavy percentage of telluride of gold and galena.

All of the mines on the Mother Lode are now running with full force, and the mills also in full blast, except one or two waiting for the completion of electrical plants, their future power. By the first of the new year, there will not be an idle stamp in the county.

## THE BELL MINE, AT TUTTLETON.

This mine is still demonstrating, by development, a splendid property—large ore body, showing free gold after every blast. A 40-stamp mill will be required in the spring.

## The Middle Belt.

## THE GOLDEN GATE SULPHURET MINE.

Seventy men are employed at the above mine. The new hoist is completed and found most efficient, and gives entire satisfaction. The chlorination plant is in full operation. This mine is a steady dividend payer.

## THE GERRYMANDER.

This mine is sending to their mill some very good-looking ore—value in sulphurets.

There are several new mines in this belt: the Campbell, Flat, the Estrella, and several unnamed. The prospects in all are good. value in the sulphurets, which is more permanent than free gold mines.

## East Belt Mines.

## THE KETTZ MINE.

The above mine is running full handed; rich rock is being uncovered; owners well satisfied.

## THE RIVERSIDE MINE.

The Riverside mine, with a record of \$180,000 from former workings, has started its new 10 stamp mill. Twenty men are employed at the mine. This mine has ore reserves to last many years. Under the management of S. Plank, it is sure to come to the front again.

## GREY EAGLE MINE.

G. W. Plummer and L. A. Engelke have sold the Grey Eagle mine near American Camp to Koble Brothers, of San Francisco. The final arrangements were made last week.

## STANISLAUS RIVER.

Messrs. Storer & Shorey, of Horseshoe Bend, have developed a magnificent property of great extent. The rock shows free gold, vein from 14 feet to 80 feet wide. They have a water power of 3000 inches, sufficient to drive all machinery, mill, electric plant, etc.

## ARGUS.

## MEXICO

(From our Special Correspondent)

## CIUDAD DE MEXICO, Dec. 18, '97.

The Sierra Mojada Company, operating in the State of Coahuila, has encountered a large body of lead carbonate ore in their Santa Esperito mine.

Mr. Carlos Eisenmann of this city, who is at present in Paris, sent a cable last week to the effect that the big deal for the transfer of the Inguaran Copper mines in the State of Michoacan to a French syndicate will go through. The price to be paid for these mines is \$3,000,000. The syndicate will construct a railroad from the mines to the Pacific coast. This is an immense concentrating proposition, requiring the erection of an extensive concentrating plant, the products of which will be shipped to Europe.

Several practical working tests will be made on the ores of these mines in the testing works of Heckelman & McCann of the City of Mexico, as soon as the same is ready to make tests to determine whether fine or coarse concentration will yield the best results.

The Santa Ana copper properties located in the state of Chihuahua will be developed on a large scale by a French syndicate. Their headquarters will be in the City of Mexico.

The properties of Mr. Albert Milliken in Durango are showing up well, and the Company contemplates putting in a leaching plant.

The Kansas City Smelting and Refining Company is putting up two 60 ton stacks on the silver-lead properties at Boquillas, near the Texas border. Mr. Wells, late of Chihuahua and Jiminez, will be the superintendent.

## PACHUCA.

## Miscellaneous Mining News.

## ALASKA.

## The Yukon Sufferers.

The House passed a bill, Dec. 16, appropriating \$175,000 for the relief of the people in the Yukon country. The Senate also passed a joint resolution appropriating \$250,000 for the relief of the Yukon miners. It will be necessary before either becomes a law for Congress to get together on a common basis.

Secretary Alger, Dec. 20, cabled to Wm. Akellmann, the government reindeer herder who is now at Alten, Norway, to inform the War Department how soon he can have the herd ready to aid in getting supplies to the miners in the Klondyke region. It is expected they will have to be transferred at New York to the railroad and in that manner carried across the continent, and again by sea up the Pacific coast to Dyea or Skagway, or some other point that may be selected as the base of operations by the expedition.

## Ruby Sand Gold Mining Company,

Of which W. M. Brook is president and August Kiser superintendent, has been for several years engaged in treating beach sand at Lituya Bay, and claims that its works are the most extensive of the kind in the world. For four years past the output has averaged \$16,000 a year.

## ARIZONA.

The Whetstone mines, belonging to Messrs. Loudon & Gaslen, have been bonded and will be opened and developed by Messrs. Harry & Sanders.

These men are well known mining men of long experience. When they looked over the property they immediately closed the deal. It is understood the figure is about \$20,000. By the terms of the agreement, a force of men will be put to work the first of the year.

This property has long been considered a fine one. From the ore on the surface, the miners say it will have a fine future.

The Sun Dance mill, near Prescott, has started up again.

By a deed filed for record last week, Henry Lang transfers all his interest in the Bullion Producer mine, Big Bug mining district, to A. B. Wilkins for \$1000.

E. H. Shakelford and A. T. Marsh have deeded to F. X. O'Brien all of their right, title and interest in the Fortuna, Pony and Minnie mines and Mr. Marsh also sells to same, boilers, engine, pumps, pipe line, etc., for the nominal consideration of \$1.00. A deed from D. O. Moore to Mr. O'Brien transfers all of the same property to the latter.—*Prescott Journal Miner.*

Just south of the Bent mines, in the Arivaca mining district, the Consolidated Oro Fino Mining Company is at work on several of their new properties, at present doing, you might say, prospect work upon their ledge, to locate at the best point a working shaft. On their Valley View mine, they last week sunk thirty feet on the ledge, which shows to be one of the largest and strongest ledges in this district, it being the full width of the shaft, and even wider in places. They are getting out some very fine looking ore, which shows to be very rich in gold and silver.

G. S. Mulkey, secretary of the Jerome Mining Company, who has been in Denver buying machinery, says that the company's workings are now down over 600 ft. and a tunnel 1000 ft. long will probably be driven to cut the ore at water level. The property adjoins the United Verde.

Suit has been instituted by a British syndicate against W. C. Bashford and Daniel E. Keating, of Prescott, for \$50,000 damages. The syndicate claims that Bashford and Keating salted the Jersey Lily mine and caused their expert to make an exaggerated report on which they paid \$25,000. Aside from the \$25,000 paid on the property, they expended \$25,000 in development work and ascertained that they had been taken in. It is claimed by the owners that the suit is only an attempt to get possession of the mine without paying the balance due on the property.

Roscoe Kinsell, of Denver, Colorado, is in Kingman, Mojave county. Mr. Kinsell is one of the owners in the Buckeye mine, at Mineral Park, and is preparing to begin work on an extensive scale on that property. The small force now at work will be augmented and the hoist kept running night and day.

Robert Roscoe has reached a depth of forty feet with the shaft of the Blue Rock mine, four miles south of Kingman, and is getting out sixteen ounce gold ore.

The officers of the New Vulture Mining company are as follows: H. M. Love, of Chicago, Ill., president; Chas. B. Ayers, of Chicago, vice-president; Chas. F. Love, of Chicago, secretary and treasurer. The other stockholders of the company are: Joseph C. McKee, of Grand Rapids, Mich.; Isaac H. Tichenor, of Milwaukee, Wis.; and William C. Davis, of Tucson. The principal office of the company is located at Chicago, but a local office is also maintained at Vulture.

The gentlemen connected with the smelter proposition in Arizona, state it is now an assured fact that it will be erected as the first shipment of machinery is to be made in a week or two.

## CALIFORNIA.

### AMADOR COUNTY.

The Monte Christo, six miles north of Volcano, is rapidly developing into a big mine. An immense block of ore, averaging from \$12 to \$15 to the ton mill test, has been stope out. The shaft will be sunk 300 feet and a tunnel driven to tap the ledge. John McCall is superintendent.

### KERN COUNTY.

The Little Butte, at Randsburg, has started up after making many improvements and is now running three shifts. The big engine is running about twenty-three hours and sixty

minutes a day. The balance of the time the engineer devotes to rubbing her down and grooming her. Things look and sound decidedly lively over on Gold Hill.—*Randsburg Miner*.

### RIVERSIDE COUNTY.

The Chuckawalla Mining, Milling and Water Company, with headquarters in this city is developing a group of claims, twelve in number in the Chuckawalla Mountains, Corn Springs Mining District. On the Sucker State, a shaft is now down 75 feet on an 8 foot vein and is being pushed with earnest. Another shaft is now being started on the vein from which a drift will be run at 50 ft. to meet the other. This is all in ore that mills \$20 a ton. On the Edina a tunnel has been run 150 feet on an 18 inch vein that mills over \$100. There is plenty of wood and water in the locality.

### SAN DIEGO COUNTY.

The receiver for the creditors of the Golden Cross mine, at Hedges, has been doing much good work as he has paid \$40,000 of the debt of the mine which was \$260,000. Mr. Pauli, who is the receiver, states that the mine could be made to pay \$100,000 per year.

In the vicinity of Hedges and Ogilby, the new and important discovery which has been made has caused much excitement in the county. Miners and prospectors have located every foot of ground.

## COLORADO.

The northern boundary of the Cripple Creek gold district has been extended three miles, by the discovery in Copper Mountain of an immense blanket vein of ore, running from \$10 to \$1,500 per ton in gold.

The Utica mine is again to the front with another big strike of fine ore.

The body of ore struck is four feet in width across its face, and is almost a solid mass of pyritic iron, with bunches of peacock matter scattered here and there. It is considered by the company, and all those who have seen the strike as extraordinary in its richness. The company is very much opposed to showing its treasures to outside parties; but this much was told by the manager, Mr. G. A. Davidson, after much persuasion on the part of friends. The average value of this ore is \$100 to the ton, and its quantity is almost inestimable. If the mine was situated in Cripple Creek, it would be considered a wonder, and always referred to by miners of Colorado.

The new matte smelter that Montana men are building at Jamestown, Boulder county, is nearing completion. They assert that they can profitably handle ore running as low as \$10 per ton.

### December Dividends.

*Ores and Metals* of Denver publishes the following report of dividends declared for December:

The Portland Mining Company held a meeting the fore part of the month at which a dividend of 1 cent a share was declared, payable Dec. 15. The total amount disbursed will be \$30,000.

The El Paso Gold Mining Company, at a meeting last week, declared a dividend of 1 cent a share, payable Dec. 10. Total amount thus disbursed is \$5,402.50.

The figures given out last week by the Isabella Co., covering the November production and earnings show that during last month the company shipped a total of 1,280 tons from its own workings, while lessees shipped 288 tons. The new smelter returns on this ore will reach fully \$30,000. The mine's operating expenses for the same period will be between \$21,000 and \$22,000. Speaking of the good showing made last month, one of the officers of the company said recently: "The production and earnings for November are due solely to the development work which has been in progress so long. This development is now beginning to bear legitimate fruits, and if the same ratio of development is held in the future, and we continue to open up ore as we have in the recent past, I see no reason why the company should not maintain its present production."

## GEORGIA.

W. M. Kelly, of Atlanta, Ga., has leased the Cornelius slate quarry, near Cedartown, from W. O. Cornelius, and is putting in machinery to work the deposit.

The Greater Pittsburg Gold Mining Company, recently organized, has bought a tract of 440 acres, near Hiawassee and will begin development work at once. The capital stock of the company is \$100,000. The officers are: President, G. A. Kline, Freedom, Pa.; secretary and treasurer, J. N. Dawdelle, Rochester, Pa.

## IDAHO.

R. Bell has some specimens of coarse, free gold ore that he got from the Combination claim on Carmen Creek. They are very rich, would assay fully \$50,000 per ton, and were taken out while doing assessment work. Mr. Bell says the vein is four feet thick and averages \$10 per ton in gold aside from the specimens.

The Petit Mining Company, after a very successful trial run, at Atlanta, has suspended operations for the winter. Mr. Frank Coffin, of Boise, and former State treasurer, is heavily interested in this property. It is on the main Atlanta vein, and is considered fully as rich as the Last Chance, Monarch, or Buffalo, that turned out millions some 10 years ago, and under proper management are capable of continuing the same record.

Considerable work is being done in a small way on the Snake River placer claims near Mountain Home this winter. The gold is very fine, but in spite of that is being saved with fairly good results by several parties. The placer possibilities tributary to this point, both on the Snake and the South and Middle Boise rivers, are good. The Snake can be worked practically 12 months in the year. The Boise River can be worked nearly nine months.

### The Blackstone Mine

Near St. Charles, eight miles south of Paris, is an excellent piece of mining property, well supplied with a quartz crushing mill and all other necessary machinery. This property, with 14 others, is owned by the Dodge Company of Salt Lake. It produces a low grade

galena ore, running about 75 per cent. lead and a few dollars in silver and gold. There is about \$6,000 of ore on the dump, and two shafts are being run.

J. N. Stacy has purchased a 40-foot gold quartz claim on Charley creek, known as "The Klondike," also the "Pioneer No. 2," on Mussel Shell, adjoining Frank Peters' claim. The former assays \$10.33 per ton, free milling, and the latter assays \$150 per ton, also free milling.

A recent cleanup of the "Crescent," after an eleven days' run of a five-stamp mill produced 234 ounces of gold, worth \$3,712. This property was formerly owned by Dunn Bros. & Carr, but has been recently purchased by Geo. B. McAulay and associates.

The five 850-lb. stamp mill for the Hi Yu mine in the Florence district of Idaho, has been set up and is running full time, with excellent results. This was the first mill built by the company and with the success so far attained, other mills are now in course of construction. These will be kept in stock, so that they may be in a position to supply any immediate demand without delay.

## MICHIGAN.

The old Winona property, some 20 miles southwest of Hancock, was sold at public auction recently by Circuit Court Commissioner Shelden, for \$13,500. It was bought by Matthew M. Van Orden, trustee of the property.

The United Alkali Company of England has taken an option on the McGraw property near Bay City, in Bay county, which contains 16 salt wells ready for operation, and salt block with two vacuum pans. The company's agents are about to prospect for coal in the vicinity of the salt works.

The exploration work of the Baltic mine goes on as rapidly as possible. Though reports have been circulated that the crosscut has found the hanging wall and shows the vein to be 45 ft. wide horizontally, yet late news from the mine is to the effect that the exact width of the ore body is still undetermined. The length of the lode is also a matter of conjecture, though there are rumors to the effect that stamping rock has been found for a distance of 600 feet.

Michigan Mining Company has been organized by Capt. Jos. Sellwood (vice-president of the Minnesota Iron Company) John McKinley (discoverer of the McKinley mine on the Mesabi) and Everett Ball, of Marquette, to operate the old Belt Copper Mine in Ontonagon County, Mich., which was idle for a score of years. Mr. Ball secured possession of the mine at tax title for \$350, and has been confirmed in his ownership by the courts, and it is now the intention to open and develop the old mine, which can probably be done at a profit by the new methods and at the present prices of copper. Captain Sellwood is president of the new company.

Hoisting of copper rock from No. 4 shaft of the Wolverine is in progress. Power for the drills in the mine is furnished by a Rand compound compressor of the latest type.

## MISSOURI.

Manhattan Mining Company has put in a large Palmer steam sinking pump, which throws 1,500 gallons per minute. Men are drifting at 183 ft. on a large face of zinc ore in open ground. They will sink the pump shaft to 250 ft. This mine has been one of the largest producers of zinc ore in the district.

Star Mining Company on the Chatham lease has started work after a shutdown on account of water for over a year. The mine was one of the largest producers on the Chatham lease.

Hollingsworth Mining Company has leased 50 acres one mile north of Jackson station. On this lease there are about 20 prospect shafts going down. The ore is found 75 to 105 ft. in open ground, with enough water to wash the ore. This lease has been producing ore for several weeks.

## MONTANA.

The *Western Mining World* announces that the United Smelting and Refining Company, lessee of the Broadwater mine at Neihart, has concluded to postpone construction of the tramway at that mine for several weeks, and possibly until spring. There is no intention to abandon the improvement, but the weather has been so unfavorable that it was concluded to defer building. The mine will be worked constantly, but with a comparatively small force.

Word has just been received from Castle that a large body of ore has been struck in the Cumberland mine. We also learn from the same party that good bodies of ore are also being shown up in the Yellowstone, Great Eastern, Jumbo and the Judge mines, and all the people of that locality have great prospects of their coming to the front.

Yellowstone Placer Mining Co. have filed articles of incorporation. The company is going to build one or more dredging machines to work the river beds and the gravel and sand bars of the Yellowstone and other rivers in Montana. The company is capitalized at \$50,000, with main office at Rosebud in Custer county.

## NEVADA.

At the Chainman active work is in progress. The management is erecting a mill. The ore averages about 15 in gold per ton.

The Robust at Ely is being developed, and has a shaft 75 feet. At that level they uncovered 5 feet, showing \$12.50 per ton in gold.

The Jupiter at Ely has a shaft 60 feet and ore running \$18 a ton. Next season a mill will be erected. D. Peters & Co., Ely, are the owners.

The mill of the Austin mine is running smoothly, and December has shown the best production for the year. Some 155 tons have been shipped since the first of December, of which 50 tons were crude.

## NEW MEXICO

The other day the gang at work on the Bland end of the Albemarle road, in making a deep side cut on the Pino mining claim, opened up and crosscut the top of a 15 foot lead of quartz that displays every indication of carrying exceedingly high values in gold. The Pino, which lies just east of the Posey and above the school house, is the property of George Hofheins, Ed Smith, Ed Lembke and M. L. Cole, who, it is declared, will immediately take steps to develop the new and undoubtedly rich discovery.

A variety of crystallized lead ore has recently been found in the Rex mine here which is new to the scientists. It is a silicate of lead with also some iron and it will be known hereafter as Robinite, being named after Geo. E. Robin, one of the owners of the mine.

A force of men is at work on the Lone Star mine and new chutes are being built and other improvements are under way. Last night a night shift was added to the regular day force and developments will be vigorously pushed.

John Butteck is sinking on a five foot chimney of gold ore in the Freiberg mine and intends to yet out at least 500 tons in time for the completion of the cyanide works.

Output of Hillsboro gold mines for the week ending Thursday, Dec. 30th, 1897, as reported for *The Advocate*:

	Tons
Wicks.....	30
Butler.....	5
Richmond.....	20
Happy Jack.....	5
Snake Group.....	60
Opportunity.....	20
Sherman.....	5
Prosper.....	5
Eighty five.....	5
Rex (silver-lead).....	5
 Total.....	 150
 Total output since Jan. 1, 1897 -	9,304.

## A NEW CORPORATION.

The Colfax Gold Hill Mining Company has been incorporated by A. M. Barnes, T. M. Irvine and J. W. Gallup. The corporation is formed for the purpose of purchasing, leasing, acquiring, owning, working and operating mining claims and mines of gold, silver, copper, nickel and all other kinds of mineral and quartz, and to own, operate and maintain all necessary appliances and machinery necessary for successful mining operations. Capital stock, \$1,500,000; principal office of the corporation is located at Cleveland, Ohio, and the principal place of business is designated as Elizabethtown, N. M.

## OREGON.

The Black Pocket mine, owned by J. J. Jewell and Davidson Bros. in Missouri Flat district is doing well. The shaft is down about 25 feet and shows good ore. The rock so far taken out has paid \$100 to the foot, which is exceedingly good.

The old McKee mine is the Forest Creek district near Ashland, bonded by Crippen and Kennedy, will resume development work at once. They succeeded in running 175 feet on the ledge last season and were so encouraged that they resumed work.

Burnham & Main of Portland last week purchased the Boggs placer on Elliott creek, and have already taken possession of it.

The second addition of stamps for the Shorty Hope mill near Ashland, have been received, and it is said ten more stamps will be put in if the ore body justifies doing so.

Mr. A. W. Silsby who is at the lower Illinois, says both of the mines in charge of himself and Fred Franks are in full operation. A nugget worth \$4 was found, and he sent it to the elder Franks as a specimen of Oregon gold.

## SOUTH DAKOTA.

The Homestake Mining Company have paid two dividends, one the regular monthly of 25 per cent, and the other an extra 25 per cent, making the total amount paid out \$62,500. Last year the company paid \$437,500, which now makes a grand total of \$6,525,000 paid up to date.

Development work has been commenced on a copper prospect near Custer Peak. A shaft is down 60 feet, and a vein of copper is exposed. A part of the claim has recently been sold to Chicago parties, who are interested in the Two Bit mines, for \$5,000 cash. The ore is said to run about 12 per cent copper and \$4 gold.

## UTAH.

The Silver King Mining Company has just declared a dividend which was a surprise to its stockholders. It came as a Christmas gift. The amount was \$37,500 or 25c. a share.

The Silver King has already paid its regular monthly dividend for December of \$37,500, and with this extra \$37,500 it makes a grand total of \$75,000.

During the year the company declared thirteen \$37,500 dividends which now makes in all \$487,500.

It is not four years yet since the company declared its first dividend and during this period thirty-six times it has distributed between its stockholders \$87,500, amounting up to date to \$1,350,000.

The Silver King is known as one of the finest silver lead producing mines in Utah.

The showing for December of the following mines show, notwithstanding the depression in the metal market, that they have enriched the world as follows:

Ontario.....	\$112,500
Silver King.....	75,000
Mercur.....	36,000
South Swansea.....	7,500
Swansea.....	5,000
Utah.....	1,000
Chloride Point.....	5,000

This makes the total for the month \$242,000 to say nothing of the private corporations and individual mine owners.

The Ajax mine has just struck a six foot body of solid copper ore, and of much higher grade than any ore yet discovered on this property. This is saying a good deal as the property is known for its rich deposits of copper and gold ore.

The company now has made enough money to pay off its mortgage on the mine beside enough for the current expenses of operation. This is a good Christmas gift for the company.

## WASHINGTON

The Bullion Mining Company, who own six claims on the Colville Reservation, eight miles west of Northport, have let a contract for sinking their shaft 50 feet further. When completed, this will make a total depth of over 100 feet. The vein shows 12 to 15 inches of solid galena, averaging 40 ounces silver and 75 per cent lead. The width of the lode, as already determined by the work, is fully 20 feet.—*Spokane Miner and Electrician*.

Both the Mother Lode and the Helen E. properties, in the Piere's Lake district, will push development work during the winter. The Little Giant is an adjacent property upon which considerable work has been done, with good results.

## FOREIGN MINING NEWS

### BRITISH COLUMBIA.

It is stated that H. L. Symons and parties represented by him intend erecting a smelter at Nakusp. This is the Mr. Symons who applied for a bonus from the City of Vancouver for the erection of a smelter there.

The Reco Mine Company is about to declare another dividend of ten cents a share and then distribute profits to the extent of \$100,000.

The main shaft at the Le Roi has reached the depth of 600 feet, and will be continued to the 700-foot level. The ore being taken out is mostly from the 450, 500 and 600 foot levels. It is expected that from this time forward the output will be about 2000 tons a week. Twenty-two drills are at work. Last week 1,080 tons were shipped. This mine is said to be the finest and largest producer in Cavado, and, besides putting up buildings and machinery, have built a large smelter and paid \$625,000 in dividends. The mine is held at \$5,000,000.

The Le Roi will sink its main shaft to the 700-foot mark. New cables will be put in, as also a new pump, with a capacity of 200 gallons per minute. Ore shipments continue daily.

The Wynstay, Burton and Maple Leaf claims, on Elk River near Wardner, have been bonded to some eastern people by the owner, Mr. George Watson, for the consideration of \$15,000.

### Slocan Developments.

News comes of one of the richest strikes in the Slocan, viz: on the Arlington. They have 12 inches of clean solid ore, which was struck in the lower drift, 160 feet from the surface. Assays run 1191 oz. in silver, and 43 per cent lead. On the strength of the report the stock is now in great demand, several sales being consummated. Treasury stock is held at 12 cents.

Messrs. Russell & Co., of Portland, Ore., manufacturers of Engines, Boilers, Sawmills, etc., will remove on or about Jan. 1st, 1898, to their new and well constructed warehouse, which is now being erected at the corner of Belmont and East First streets. They will now be in a much better position to handle their increased trade.

## GENERAL NEWS.

### To Prevent Mine Accidents.

Mine Inspector Byrne, of Montana, makes report in which he says: "Unlike most other callings, the security of the miner is largely dependent upon the care and prudence of his fellows, but so wide is the character and disposition of men that, in order to obtain unity of action from large numbers, the necessity of subordinating individual plans and methods to a well organized general system must be evident. The duty of the superintendent does not cease when he furnishes means of safety and issues instructions. He should see that the one is properly used and the other implicitly obeyed, and in no instance should he allow the subordinate officials to jeopardize the safety of those in his charge."

"Opposition has been manifested to the law requiring the enclosure of safety cages in vertical shafts. The purpose of the law is to protect the miner against the various dangers encountered while being lowered in or hoisted out of the mine. The necessity of it is shown by the number of lives sacrificed while riding in open cages in the past. With a few exceptions, the law had been complied with. Conditions existed in those exceptions which made it nearly impossible to comply with it within the time specified. A degree of indulgence has been exercised in this matter, in the hope of removing certain prejudices existing among a considerable number of employees as well as a few mine owners; also to allow time in which to complete improvements and changes planned previous to the enactment of the law. I am convinced that reasonable leniency is the better policy as against arbitrary enforcement. Sufficient time has now intervened to demonstrate the feasibility and advantage of the measure, by pointing to its successful application elsewhere. Now that these conditions which formerly operated against the immediate enforcement of the law have practically disappeared, proper steps have been taken to secure its rigid observance in the near future."

### For Deep Mines.

Deep mining promises to be the rule in Leadville, and during the next year a number of deep shafts are to be sunk to catch the rich ore deposits uncovered in the 900 foot shaft of the Mab. The lessees of the Mab have commenced sinking again to get under the ore body, and will not commence shipping until the extent of the ore has been shown. S. G. Collins, manager of the Rialto Leasing and Mining Company, which has secured leases on the Chestnut, the Walnut, the Iron Queen and the Pyrenes, said: "We have some of the best property on Iron Hill," and every dollar invested is from Boston. The shaft was down 650 feet when we leased the property, and we have let a contract for 500 feet further, which is being sunk now at the rate of five feet per day. We have put up a plant of machinery and buildings at a cost of \$7,000 and we propose to go down until the underlying wealth of the camp is demonstrated in our ground. We have the example of the Mab to guide us and are prepared to thoroughly exploit our territory. The fact that we have all the money raised to sink to the depth at which we expect to find ore, is proof that the company has confidence in the district. The existence of a rich body of sulphide ore at a great depth has long been suspected and now that it has been shown, deep mining will be the rule in Leadville.—*Mining Investor*.

### Michigan Iron Mines.

The independent mine owners—those corporations of moderate capital and medium sized mines—are feeling much better over the prospects for 1898. They should remember that they are not out of the woods yet and will do a shrewd stroke of business for their shareholders if they sell out, bag and baggage, during the good times that promise to prevail in the iron mining industry for several years to come. The handwriting on the wall bodes no good for the smaller operators and such of them as are not exceptionally well situated and very cleverly managed must eventually go under in the competition with larger and more powerful neighbors. When the situation resolves itself into the survival of the fittest, as it eventually must, the corporation owning railroads and fleets of steel steamers, having close furnace connections and rich mines, is bound to crowd out the smaller competitor which has nothing but a mine.

The Murray Iron Works Company of Burlington, Iowa, closed the year with some heavy shipments of machinery which wound up a number of 1897 contracts and cleared the decks for 1898. Among the engines and boilers we note the following:

One 700 H. P. cross-compound, direct-connected Corliss for a Texas street railway.

One 450 H. P. Corliss for a Missouri municipal lighting plant.

One 350 H. P. Corliss for a Nebraska packing house.

One 150 H. P. Corliss for a Colorado stamp mill.

One 150 H. P. Corliss for an Iowa municipal electric lighting station.

One 75 H. P. Corliss for a South Dakota flour mill.

Four 70 H. P. high pressure boilers for an Iowa water works.

One 70 H. P. for a South Dakota water works.

One 70 H. P. high pressure boiler for an Iowa electric light plant.

One 60 H. P. for an Iowa flour mill.

Three 80 H. P. boilers and three 40 H. P. boilers and several hoisting engines for western mining camps, and several carloads of mining machinery for Mexico.

The entire plant has been operated full time throughout the fall and the Corliss engine works and boiler shops have been run overtime.

Messrs. Smith & Irving, assayers and refiners of this city, have just sent us their Miners' and Prospectors' Guide. It contains the latest mining laws and regulations besides water rights and many Supreme Court decisions on mining. It explains about the different ores, how they are treated and their commercial value. It is a book any miner or man interested in mines needs. It will be sent to any address for postage, four cents in stamps.

### Notes About Drills.

In preparing coal mining bits for chain machines, forge the bits into shape, then allow them to cool to a black or to grow cold; now reheat to a low, even red and harden in clean, fresh water. Draw to a blue; put them into service and you will be repaid for the extra care by their durability. They may not cut "sulphur balls" but will try to.

Some of your forges are in a very bright light and the heat runs up without your being aware of it.

In long drills susceptible to springing, increase the thickness and you will do away with the trouble.

The payment of heavy dividends by mining companies during the month of December has given quite a stimulus to the mining industry throughout the state and people are beginning to realize more and more that the imperishable wealth of this country comes from the mines, and especially those who have been the recipients of dividends during the month.

The Weber Gas and Gasoline Engine Co. of Kansas City, Mo., have made recent extensive improvements to their already large plant. They have just completed an addition to their shop which includes a fully equipped testing room with a capacity of testing 12 engines at one time, a large shipping and salesroom and doubling their office capacity. By relieving the machine shop of the testing and erecting part of the work they have practically doubled their capacity.

The Murray Iron Works of Burlington, Iowa, has brought suit against R. G. Dun & Co. for false reports published in their journal. Dun & Co. reported the Murray Iron Works as having given a deed to preferred creditors, while as a matter of fact, the Murray Iron Works had simply filed a trust deed to cover the issue of bonds to secure funds for the extension of their business. This company has no debts and no creditors, consequently can prefer none.

The committee in charge of the Golden Jubilee is receiving hearty support in its efforts to make an imposing display at the fiftieth anniversary of the discovery of gold. Various societies, including the Society of California Pioneers, have promised financial aid, and many subscriptions have been received from private individuals.

### American Dynamite in South Africa.

From Cape Town, South Africa, Consul Roberts writes: "Such an important position does the dynamite trade occupy today in that part of Africa, south of the Zambesi, that peace in the Transvaal, it might be said, depends much on its regulation. The first suggestion mentioned by the mining commission, appointed by the Transvaal Government, some time after the Jameson raid, to investigate the alleged grievances of the Johannesburg Uitlanders, was to lower the tariff on dynamite. This, the commission believed, would go far to conciliate the influential element on the Rand, mine owners, shareholders and mining engineers. It was the almost prohibitive duty on dynamite that incited the better class of Americans, who form a vast majority of the mine managers, engineers and experts at Johannesburg, to take part in the Jameson fiasco. It was due to these men also that American dynamite was introduced into South Africa, until now the United States furnishes more than any other country to this portion of the world. It is satisfactory to note, however, that this steady growth may be ascribed to the superior quality of the American goods, which is attested to by nearly all mining men on the Rand, irrespective of nationality. This is shown from the fact that dynamite can be delivered in the Transvaal from Hamburg, including cost of importation and duty, at 37s. 7d. (\$9.39) per case, and from Dr. Nahnsen's factory for 46s. 1d. (\$10.87), while the rate from America is 47s. 7d. (\$11.22), but the

latter country, nevertheless, has the call on the trade. The cost from Cornwall is 52s. 1d. (12.33) per case. The quantity of dynamite and other nitroglycerine compounds landed at Cape Town from abroad, in the year ended December 31, 1896, was 55,000 pounds, valued at £791, or \$3,955. Dynamite and blasting compound powder (practically all the former) was imported into the colony during the same period to the amount of 12,327,540 pounds, valued at £538,245 (\$2,619,225). Of this amount, 1,301,210 pounds were entered for consumption under the union customs act prevailing in Cape Colony, Orange Free State, Basutoland and the Bechuanaland protectorate, while 10,940,013 pounds were for transportation to the South African Republic and Rhodesia, an insignificant portion being shipped to the latter province.

"The duty on blasting compounds for consumption in the countries included in the customs union is 3d. (6 cents) per pound. On that entered for transportation to non-union countries a transit duty of one-half of 1d. (1 cent) per pound is levied.

"Immediately on the discovery of gold in the Transvaal, dynamite came into great demand, and syndicate, seeing the opportunity for immense profits, obtained a concession from the Government to manufacture the explosive. This developed later on into a monopoly, for, when the mine managers objected to the Transvaal article, which was manufactured from ingredients procured in Germany, the duty on the imported article was raised to what was expected would prove a prohibitive rate. The top rate reached was 9d. (18 cents) per pound. Figuring on the rate per pound as 1s. 9d. (42 cents), and including the transit duty, and other details of shipment not counted in the computed total, the cost of the article delivered at Johannesburg is just double the wholesale cost at Cape Town.

"Many mines preferred to pay the exorbitant rate and get the American article, but there was enough demand for that manufactured in the Transvaal to cause a great rush, and when the syndicate found they could not put the imported ingredients together fast enough, the manufactured article was imported straight from Germany and entered, of course, free of duty."

### Winning Nickel by Electrolysis.

Nickle, standing metallurgically between iron and copper, can be won by methods analogous with those proper to both the latter metals. Thus sulphide ores may be run to a matte, and oxide ores directly reduced to crude metal. A similar relation is evident in the behavior of metal when treated by the wet methods of extraction, which resemble those for copper. Although this process will not serve for the direct precipitation of metal, its similarity to iron prevents such easy reduction. Since electrolysis has been brought to bear upon the winning of copper, and with so great a measure of success, attention has naturally been turned to the production of nickel by the same or allied processes, but hitherto many difficulties have been encountered. However, the advocates of electrolysis are so steady in their determination to overcome these difficulties and make electrolytic processes commercially possible, that already the production of nickle in this way can almost be considered as a recognized process of manufacture. Foremost amongst those who have engaged their attention upon the production of nickle by electrolytic methods is F. Foerster, whose papers in the *Zeitschrift für Elektrochemie* have attracted much attention. In a

recent issue of the *Zeitschrift*, *vide* No. 4, pages 160 to 165, Foerster describes experiments made with carbon as anodes, but it seems that he did not obtain very successful results for the carbon employed very quickly became soft and broke down in the hot nickel chloride solution. It is possible, however, that better grades of carbon might yield more satisfactory results, especially if lead peroxide be used as the anode, and the solution worked with a sulphate.

Most of Foerster's recent work, however, has been carried out with soluble nickel anodes. This is, of course, the method used in the electroplating of nickel, but hitherto only thin coatings of the metal have been obtained, the metal soon becoming scaly and parting from the electrode. This is a difficulty which every one is familiar with who has ever done any electroplating with nickel, but Foerster states that it can easily be overcome by keeping the temperature of the electrolyte at anything over 50 and up to 90 deg. C., in which range he has succeeded in forming tough deposits of the metal both from solutions of the sulphate or the chloride. On the whole, Foerster prefers the solution of the sulphate, and he works with a concentration equivalent to 145 grammes of commercial nickel sulphate per liter at temperatures between 50 and 90 deg., and with current densities varying from 0.50 to 2.5 amperes per square decm. A higher current density yields a lighter and smoother metal. With the same current and more concentrated solutions of nickel sulphate (equal to 100 grms. of nickel per liter) the metal was deposited in a dull, rough state. It seems that with an increased concentration a denser current is required, for, from the solution last referred to, the metal was obtained at the cathode in a bright, silvery-white condition, using a current of between 2 and 2.5 amperes per square decm. The cause of the irregularities and roughness noticeable in the deposit is due to the formation of bubbles of hydrogen at the cathode, which tears up the surface.

In a large scale experiment, 0.50 kg. of nickel was deposited upon a cathode of 2 square decm. superficial area. The solution used contained 100 grms. of nickel per liter; the current density employed was 1.5—2.0 amperes; the temperature was maintained at 60 deg. C.; and the EMF. required, with the electrodes at a distance of 4 cm., was between 1.0 and 1.3 volts. The nickel obtained was exceedingly tough, and the author concludes that, using hot solution, the electrolytic deposition of nickel upon any scale of operations is possible. The composition of the deposited nickel is effected by any iron and cobalt which the crude metal may have contained, and the separation of these three metals is not possible by alterations of the EMF. and current density, unless the nickel solution be treated with tartaric acid and an excess of sodium hydrate. Working with a solution of nickel chloride, it was found that the difficulty of producing a firm, tough deposit from the cold situation was not eliminated when the solution was heated, for under these latter conditions basic chloride makes its appearance at the cathode. However, Foerster did succeed in preventing the currents of this impurity by adding to every 100 cc. of electrolyte 0.25 grm. of hydraulic acid. Under these conditions very satisfactory deposits of nickel were obtained from solutions containing 5 to 12 grms. of metal per 100 cc. at temperatures ranging from 50 to 90 deg. C., and by means of currents ranging in density from 0.70 to 3 amperes per square decm. The

greater the current density and the degree of concentration of the electrolyte, the tougher and lighter in color was the deposit. In his paper Foerster describes the character of some of the alloys of nickel and iron obtained in attempts to deposit nickel electrolytically from solutions containing much iron. Other experiments are also described, and on the whole this last paper of Foerster's may be regarded as a useful contribution to our knowledge of the subject.

The Alaska-Treadwell Mining Company, of San Francisco and Douglass Island, have purchased through J. A. Lacy of San Francisco, Cal., of the Stetson-Post Lumber Company of Seattle, five million feet of lumber for the erection of two new stamp mills on the famous Treadwell mine in southeastern Alaska. The amount of lumber required for immediate delivery is about 2,000,000 feet. Of this there will be 1,600,000 feet of dressed lumber. The balance will be heavy timbers, running as large as 18 by 24 inches, thirty-three feet long. The heavy timbers will be framed at the yards of the Stetson-Post mill, by workmen engaged by the Alaska-Treadwell Mining Company. The lumber will be shipped from Seattle to Douglass Island. Shipments will begin about the first of February.

H. N. Maguire, president of the Lost Cabin Gold Mining Company, is about to start east to purchase a milling, concentrating and cyaniding plant for the Lost Cabin and the Transvaal, contiguous claims owned by the Lost Cabin Company, near Wolf Lodge, Idaho. L. C. Waller, one of the trustees, will probably accompany the Judge on his eastern trip. "We expect in a few months to show the product of a five or ten stamp mill, with the latest gold-saving appliances. We expect to accomplish results with this plant such as would be expected only from a much larger mill," said Mr. Maguire.

#### Electric Furnaces.

Many kinds of electric furnaces have been suggested from time to time for the manufacture of calcium carbide and other similar products, but they have all shared the same defects: these are that the process is not continuous, the operation having to be stopped and the furnace allowed to cool before the manufactured product can be removed, and also that the product contains a certain amount of the raw material from which it is manufactured. The usual plan is to have the lower electrode consist of an iron plate or crucible which is fixed, while the upper electrode is formed of carbon and is movable, being raised as the charge is fed into the furnace. The consequence of this is that the resistance, and therefore the voltage, is constantly varying, and that the fused calcium carbide or other product is subjected to the action of the current whilst fresh material is being brought into the action of the arc, and the manufactured product is not always as uniform as could be desired.

These defects Mr. W. S. Horry has set himself to overcome, but with what prospect of success experience obtained by manufacture on a commercial scale can alone determine. Mr. Horry constructs his furnace in the form of an open hopper of firebrick, suspended from two standards, so that its lower end hangs just over the space between the two carbon electrodes in which the arc is struck, and between the flanges of a rotary spool or

reel, to which movable cover plates can be attached, slots being formed on the peripheries of the flanges for this purpose. The carbons rest on the fireproof material of which the hopper is constructed, and their electrical connections are protected by it from the heat of the furnace, the edges of the carbons being bevelled so that they present vertical surfaces to the space between them. The length of the arc is thus kept constant, and does not vary as in most other forms of furnace. The mixture of coke and lime is fed into the hopper, and is converted into calcium carbide in the arc, and when the ammeter shows that the current rises, the spool is rotated to remove the product from the furnace. The action of the furnace is thus made continuous, fresh material being fed into the hopper as that converted into calcium carbide is removed in a plastic sheet, the reel being rotated as required until it is nearly full, when, by lifting off the cover plates, the portion of calcium carbide first formed can be cut off.

#### PERSONAL NEWS ITEMS

MR. W. WALKER of the Boston Pantasma Milling and Mining Company, of Victor, Calif., called at the JOURNAL office last week. They are putting up one of the finest ten-stamp mills in this section of this country to do all kinds of custom work. The mill will be in running order on the 20th inst.

LEW. E. AUBURY, the mining engineer, has returned from a trip through eastern San Bernardino county. He reports a snowfall over a large section of territory—and a Klondyke climate, etc.

E. DAVIS, who formerly ran the Esmeralda mine in Calaveras county, has been appointed superintendent of the Dead Horse mine at Summersville in Tuolumne county, Cal., in place of Mr. Thomas who has held that position for many years.

GEORGE W. KOSTER, the well known mining man, arrived in Kingman, Arizona, from Los Angeles, Cal., last week. He will probably engage in mining in that country.

L. LINDSEY of Nogales, Ariz., made the JOURNAL a pleasant call the other day. Mr. Lindsey will remain in Los Angeles a few weeks before returning.

GEORGE BLAKE, superintendent of the Bell mine in Tuttletown, California, is stopping at the Waldeck Sanitarium in San Francisco, Cal.

E. C. PRATT, resident of New York City and associated with J. W. Mackay, is said to be the purchaser of the Grand Reef mine, fifty miles north of Wilcox, Arizona.

J. P. CALP has been appointed superintendent of the Chihuahua Mining Co.'s mines near Chihuahua, Mexico.

L. E. PORTER, the noted cyanide man of Los Angeles, was a caller at the JOURNAL office last week.

MR. L. A. DOCKERY, a mining engineer from Santa Fe, came to Chihuahua, the fore part of last week, for a visit of a few days.

EDWARD A. TAFT, representing Poole Bros.' Mining Directory, published at Chicago, Ill., paid the JOURNAL a very pleasant call the other day.

Manager G. R. Bothwell of the Sacramento, who has just returned from an inspection of that mine, states that he is more pleased with it than ever before, and that new bodies of good milling ore are constantly being disclosed.

CLARENCE S. KING, the well known mining expert, who has had more practical experience in mines than a large majority of experts of his years, will leave in a few days for Tacoma, Wash., where he will probably outfit for Klondyke, in which case we expect to hear of his return with a large fortune if there is any to be made in that frozen and benighted land.

T. L. STRINGHAM, who has been mining in the Greenhorn mountains in Kern county, Cal., was a caller at the JOURNAL office last week.

## THE MARKETS.

NEW YORK, Dec. 27th, 1897

The following are the Silver, Copper and Lead quotations for the last two weeks:

	SILVER.	COPPER.	LEAD
Dec. 13	58 $\frac{1}{4}$	10 85	3 55
" 14	57 $\frac{1}{2}$	10 85	3 55
" 15	57	10 85	3 55
" 16	56 $\frac{3}{4}$	10 87 $\frac{1}{2}$	3 60
" 17	56 $\frac{1}{2}$	10 87 $\frac{1}{2}$	3 50
" 18	56	10 87 $\frac{1}{2}$	3 50
" 19	56 $\frac{1}{4}$	10 85	3 50
" 20	56 $\frac{1}{4}$	10 87 $\frac{1}{2}$	3 50
" 21	56 $\frac{1}{2}$	10 87 $\frac{1}{2}$	3 50
" 22	56 $\frac{1}{2}$	10 87 $\frac{1}{2}$	3 50
" 23	56 $\frac{1}{2}$	10 90	3 50
" 24	56 $\frac{1}{4}$	10 95	3 55
" 25	57	10 95	3 55
" 26	—	—	—
" 27	—	—	—
" 28	—	—	—
" 29	—	—	—
" 30	—	—	—
" 31	—	—	—

Silver has been in fair request and the chances of the price being maintained through December were decidedly good.

The United States Assay Office reports the total receipts of silver at 214,000 ozs. for the last two weeks.

## COPPER.

The New York market closed quiet but firm last week at 10.87 $\frac{1}{2}$  @ 11c. for spot and December Lake ingot; casting copper, in car lots, M. A. 10.62 $\frac{1}{2}$ ; Orford, 10.75c; other grades; electrolytic, 10.75 @ 10.87 $\frac{1}{2}$ .

## LEAD

This metal is dull in movement, but fairly firm in price.

The quotations were \$3.55.

## SPELTER

The market for spelter is somewhat stronger than at last report with \$3.80 as an approximate.

The St. Louis market is quoted at \$3.80 and the New York market at \$4.95.

## ANTIMONY.

The quotations are 7 $\frac{1}{4}$ @7 $\frac{1}{4}$  for Cookson's; 7 $\frac{1}{4}$ @7 $\frac{1}{4}$ c. for Hallett's; 7 $\frac{1}{4}$ c. for Japanese and 7 $\frac{1}{4}$ @7 $\frac{1}{4}$ c. for U. S. Star.

## NICKEL.

Business continues moderate and no change in prices can be reported.

New York quotations for ton lots are 33 $\frac{1}{2}$ c. and 36c. per pound and for smaller orders 35 $\frac{1}{2}$ c. and 38c.

## TIN

The New York market closed quiet last week. Closing prices were \$13.65 and \$13.80 for spot and December.

## PLATINUM.

Prices are firm at \$14 and \$15 per oz., New York. For chemical ware, best hammered metal, Messrs. Eimer & Amend of New York furnish the following quotations, the prices given below being respectively for orders of over 250 grams; for orders of over 100 and less than 250 grams and for orders of less than 100 grams. Crucibles and dishes, 57c., 58c. and 59c. per gram. Wire and foil are 55c., 56c. and 57c. per gram.

## QUICKSILVER.

The New York quotation has been reduced \$1.25 and is now \$37.25 per flask. San Francisco quotations are \$39 for domestic consumption.

## POWDER.

The market is steady at San Francisco with no change in quotations.

For Hercules No. 1, from 11 $\frac{1}{4}$ c. to 17 $\frac{1}{4}$ c., according to strength and quantity. No. 2, from 9c. to 11c., according to strength and quantity.

## COKE.

The Coke market is steady with a fair demand reported.

The market is quoted as follows at San Francisco:

English, to load, — @ —  
" spot in bulk, .11 00 @ —  
" in sacks, .12 00 @ —  
Cumberland, .10 00 @ —

## BORAX.

The San Francisco market in Borax is fairly firm.

Refined, in carload lots, in barrels, 5 $\frac{1}{2}$ c.  
Refined, in carload lots in sacks, 5 $\frac{1}{2}$ c.  
Powdered, in car lots, 5 $\frac{1}{2}$ c.  
Concentrated, in car lots, 5 $\frac{1}{2}$ c.

## THE MINOR METALS.

Quotations are given below for New York delivery:

Aluminum:  
No. 1, 98 per cent. ingots, per lb, 34@40c  
No. 2, 94 " " 31@34c  
Rolled sheets, " 38c up  
Alum.-Nickel, " 33@39c  
Bismuth, per lb, \$1.30@1.80  
Phosphorus, per lb, 45@50c  
Tungsten, per lb, 70c  
Tungstic acid, " 45c  
Ferro-tungsten, 66 per cent, 60c

## CHEMICALS.

There has been no change in business during the week, and deliveries have been principally on contracts. However, we note some further contracts taken for 1898 delivery.

Quotations, generally, are as follows:

## CAUSTIC SODA.

Quotations for caustic soda are \$2.10 to \$2.20 per 100 pounds.

## ALKALI.

Domestic, 58 per cent., 65c. for 50 ton lots and over and 70c. and 80c. for smaller quantities. 48 per cent., \$1.00 and \$1.20 for jobbing lots.

## CARBONATED SODA ASH.

48 per cent., 90c and 95c. per 100 lbs. 58 per cent.

## BI-CARBONATE OF SODA.

English, \$2.00 and \$2.25 per lb. American, bulk \$2.00 and \$2.25 per 100 lbs., according to brand.

## SAL-SODA.

English, 67 $\frac{1}{2}$ c. and 75c. per 100 lbs. American, 62 $\frac{1}{2}$ c. and 65c. per 100 lbs.

## CHLORATE OF POTASH.

\$9.50 and \$9.75 per 100 lbs.

## ACIDS.

Business has been rather active and prices have been fixed for delivery over 1898.

Prices are per 100 lbs. in New York and vicinity in lots of 50 carboys or over. Quotations are as follows: Acetic acid, commercial No. 8 \$1.50 @ \$2.00; redistilled, 28 per cent., \$2.00 @ \$2.15; Muriatic acid, 18 per cent., 90 @ \$1.50, 20° \$1 @ \$1.75; 22°, \$1 $\frac{1}{2}$  @ \$2, according to make and quantity. Nitric acid, 36° \$2.25 @ \$4.18; 40°, \$3.75 @ \$4.75; 42°, \$4.18 @ \$5.00. Oxalic acid, \$7.25 ex-dock and \$7.50 ex-store. Mixed acids, according to mixture. Sulphuric acid, 66 per cent., \$100 @ \$1.75. Chamber acid, 50° \$8 per ton at factory. Blue Vitriol, \$3.75 @ \$4.25 according to grade and order.

## BRIMSTONE.

Business is of a routine character and prices are \$21.50 @ \$21.75 per ton for best unmixed seconds on spot, and \$20.75 @ \$21 for shipment; thirds \$1 less. Arrivals at New York aggregated 2,510 tons from Giregenti, Sicily; at Baltimore, 2,400 tons. We also note that there were arrivals at New York from Huelva, Spain, with 1,480 tons crushed and 257 tons lump sulphur ore (pyrites).

## MURIATE OF POTASH.

We quote New York and Boston, 1.75 @ \$1.78c. Philadelphia and Norfolk, 1.76 @ \$1.79 $\frac{1}{2}$ c.; Charleston, Savannah, Wilmington and New Orleans, for 80@85 per cent. basis of 80 per cent., \$1.78 $\frac{1}{2}$  @ \$1.81c in lots of 50 tons and upward.

## KAINIT.

Invoice weights as taken at port of shipment per ton of 2,240 lbs. testing 12.4 per cent. actual potash, equivalent to 23 per cent. sulphate of potash, \$8.80 @ \$8.90.

## NITRATE OF SODA.

Trade continues quiet and quotations are \$1.65 per 100 lbs, for spot and \$1.55 @ \$1.60 for futures.

The Pacific Coast Borax Company has acquired from the White estate a tract of land at Bayonne, N. J., adjoining that occupied by the Standard Oil Company. The plot has 115 feet water front, and runs back about 1,500 feet, widening out in the rear to 225 ft. The building to be erected will cost about \$100,000. It is to be of concrete and iron and will be absolutely fireproof. The land will bring the figure up to \$200,000, and with the machinery the sum will go beyond that. The Bayonne works will supply the East, while those at Alameda Point in California will also be kept in operation at their present capacity. The new plant will operate under the Ransome-Smith patents.

Comptroller of the Currency James H. Eckels in his annual report gave much consideration to postal savings banks in order to bring all the information he possessed before the members of congress. The report contains the English postal savings bank law and says the growth of the system is remarkable in spite of the fact that the rate of interest is but 2 $\frac{1}{2}$  per cent and the investment of funds confined mainly to government securities. There were 6,453,597 depositors in the Great Britain postal savings banks at the close of 1895, and 90 per cent of these belonged to that class whose deposits aggregated but \$30 annually. The other 10 per cent averaged \$525.

The report then quotes the laws of other countries and gives statistics showing the prosperity and popularity of postal savings banks there.

Mr. Eckels gives the following table, which shows the growth of the system in the countries where postal savings banks are in operation:

	No. of depositors	Deposits	Average deposit.
United Kingdom	6,453,597	\$ 489,344,875	\$ 75.82
France	2,488,075	160,691,705	69.66
Italy	2,896,768	89,724,465	30.97
Australasia	474,688	70,088,025	147.56
Belgium	882,370	63,693,274	72.18
Austria	1,110,091	\$ 32,141,6	19.93
Banking Dept.	28,363	27,270,964	961.50
Hungary	27,675	5,429,098	146.83
Savings Dept.	3,767	3,634,108	964.72
Canada	125,853	29,232,784	233.36
India	653,892	28,418,460	43.45
Netherlands	499,963	15,557,651	37.12
Sweden	408,287	-0.096,745	26.20
Cape Colony	43,672	7,675,270	175.75
Totals	\$16,345,159	\$1,016,547,480	\$ 62,19

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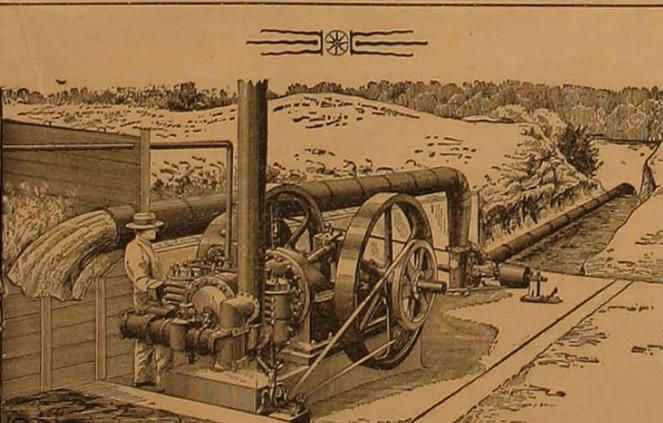
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## MINING STOCK MARKETS.

LOS ANGELES, CAL., Dec. 30, '97.

The market is now beginning to experience the usual holiday inaction. A small run of business is in progress, and some consideration is being given to the requirements for the early part of 1898, but as a rule there is not much offering in the way of fresh business.

Brown Lake is making a good showing. East Amargosa has been selling at \$1.00 per thousand and has been making slight advances. Gold Bug has attracted considerable attention. Blocks of Gold Bug stock were sold at \$8.00 per thousand. One of the best stocks on the market is Mohawk Acton, and buyers consider they have a good bargain.

Magganetta stock does not seem to be very active. Pacific Consolidated of Red Rock, Kern County, Cal., has been quite a feature on the exchange this week. Stock was selling at \$3.25 per thousand, and a great many thousand shares changed hands. Wedge is also picking up, having sold some nine thousand shares at \$2.50 in one day. The market will in a few days show an improvement.

Southern California has a bright future, and Los Angeles is the most central point of a rich mineral country, and no doubt, the Exchange has the best location batainable, and will prove a grand successful enterprise.

SAN FRANCISCO, CAL., Dec. 29, 97.

The market has been declining, and, from present conditions, will still go lower, when it is expected it will make a firm advance. Few thought in 1870 that there was any ore in Crown Point or Belcher on the Comstock, below the depth they were then working, but the largest value of metal from those mines was subsequently discovered and removed and dividends paid. This caused more persistent work elsewhere which led to the large ore deposit in Con, Virginia, and California, from which large dividends were paid, and sent the shares of twenty-three leading mines from about \$5,000,000 to over \$270,000,000. Two years after the highest prices, the same mines sold down to \$30,000,000, only to recover to \$114,500,000 in the Sierra Nevada deal, which sold up to \$280 a share. Preceding the Con. Virginia deal in 1886, the shares of the twenty-three mines sold on the basis of about \$1,500,000. When the deal was at its

height they sold at over \$40,000,000. These are only given to show that the Comstock mines have as many lives as the proverbial cat, and least looked for, the shares go from absurdly low prices up to big figures. There is very active work going in the Comstock mines, and it is quite safe to affirm that such shrewd and successful men as D. O. Mills, John W. Mackay and Col. Alvina Hayward, and others, would dispose of their milling and other interests on the lode if they did not believe that history will repeat itself again. The formation is favorable. No change in the work on the Central tunnel level. From Con. Virginia there is nothing new; the work is confined to exploiting on the 1550-foot, 1650-foot and 1750-foot levels. Best & Belcher and Gould & Curry are repairing the Bonner shaft. No change is reported by Savage. No change in the Chollar-Potosi joint work. Active exploiting work is being done in Potosi with varying success. They are drifting south on the tunnel level.

SALT LAKE, Utah, Dec. 24, 1897.

Stocks were quite active on the floor of the mining exchange, and the dealings were distributed over quite a range of leading securities.

Ajax, during the chronicled continued advances, closed strong at 37 cents bid, while there was a noticeable demand for Bullion-Beck and Continental-Eureka. Four Aces recorded another fractional gain and was somewhat stronger in the asking. Considerable attention was paid to Geyser-Marion, which was active and a ready seller. Mammoth fell off somewhat in the bidding, while the same could be said of Mercur, and yet both of these securities were firm in the holdings. Northern Light was one of the features of the call, and made an excellent record, as well as gains over previous figures, holders being rather averse to selling at the prices quoted. Overland advanced to 35 cents in the bidding, with no sellers in the pit. Ontario made its presence felt by the transfer of 100 shares at \$4.05.

In the unlisted stocks considerable skirmishing was indulged in when Chloride Point was called, the result being that 200 shares were transferred at 46 cents. Swansea noted a sale at a decline below the figures of three weeks ago, while South Swansea was in excellent form, and registered a sale at \$1.37 1/2.

It is understood that the Sacramento Milling company has made application to list its stock on the board, while it is stated that it will not be long before Chloride Point will find a place with the regularly boarded stocks.

VANCOUVER, Dec. 29, 1897

The clean-up at the Golden Cache mines for the month's run, during which time there were 750 tons crushed, resulted in 900 oz. of amalgam being taken from the plates, which when retorted amounted to about \$3300.00 or \$4.40 to the ton.

This result has been extremely disappointing to a great many of the shareholders, as they expected that the result would not go less than \$10.00 to the ton. In consequence of this the stock has dropped from \$1.80 to 30 cts. per share.

At the Tin Horse mine in the Fairview Camp they were only able to run their mill for five days, as the frost got into the pipes. However for the five days they got over \$1000.00 from the plates.

The Stock Market is very quiet with little or no business doing, but as soon as the holidays are over things will no doubt begin to move.

The Rossland Camp is attracting a great deal of attention at present and will have quite a boom again in the Spring.

The Twin Silver Mining Co., whose property is in the Ainsworth, (B. C.) district, have placed considerable treasury stock in Quebec and Montreal, at 15 cents. Promoters' stock is pooled until the mine shall be on a paying basis. The company are at present driving a 200-foot tunnel.

The Slocan district in West Kootenay has during the past year shipped in large and small amounts of silver-lead, f. o. m. over fifty claims, and the production of \$2,000,000 in 1896 will be much exceeded in 1897. In 1896, 18,215 of this rich silver-bearing lead ore from the Slocan yielded net 117.4 ounces of silver per ton and 52.7 per cent lead, leaving a net profit of \$75 per ton. By customs returns so far the output for this year should show much better, as this year 35,000 tons have been shipped of this class of ore. Much active work is in progress and many new properties are being developed.

PERCY W. CHARLESON.

NEW YORK, Dec. 24, 1897.

Dealing in mining stocks has been only moderately active this week, owing in part to the approaching holidays. On the Consolidated Exchange there was a better inquiry for the Colorado stocks, especially those of Leadville, owing to good developments in the Small Hopes property. Bidders raised the price of Small Hopes from 55c. a week ago to 75c. Leadville Consolidated, which has not been dealt in since early in November, sold 550 shares at 8c.—a drop of 17c.

Lacrosse appeared this week after an absence of about three months, sales being made at 11c. Little Chief changed hands at 14c. Of the other Colorado stocks Isabella sold at 33c. to 34c. This company reports a net profit in November of \$11,472. It has been announced that Mr. J. J. Hagerman's right to vote all stock of this company known as "Stamped Isabella" ceased on December 15th, and all such stamped stock can now be exchanged for the regular stock.

Elkton was decidedly quiet in the local market, notwithstanding the fact that the company realized a net profit of \$3,873 in November, and that the closing month of the year will show a similar gain. Golden Fleece advanced from 53c. on week before last to 63 1/2c. on December 21st. The company reports a net profit of \$4,526 in November, against \$7,489 in the previous month. Lillie was called on the Mining Exchange this week, and there were buyers of 300 shares at 72c. The company paid its second dividend of 1c. per share on December 1st, making a total of \$17,000 paid so far.

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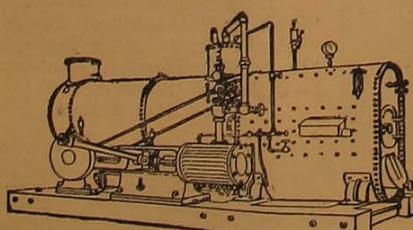
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## MINING STOCK QUOTATIONS

## BOSTON

Atta Con.	4 00	Humboldt	—
Alton	—	Hillside Steel	40 00
Anaconda	3 00	Kingsarge	17 00
Arnold	—	Lake Superior Iron	—
Atlantic	22 00	Merced	4 75
Bonanza	—	Napa Cons	8 50
Boston and C. C.	—	New Idria Mg	—
Boston & Mont. 135%	20 25	Old Dominion	20 25
Butte & Boston	20 25	Osceloa	34 50
Calumet & Hecla	450 00	Pioneer	5 06
Catalpa	—	Quincy	110 12
Centennial	15 50	Ridge	—
Central	—	San Isobel	—
Dominion Coal	21 50	Tamarack Jr.	—
Dominion Pref.	104 00	Tamarack	126 00
Franklin	—	Tecumseh	3 00
Gold Coin	2 00	Wolverine	18 00

## NEW YORK.

Alamo	03 1/4	Homestake	29 50
Alice	4 00	Iron Silver	—
Annetta	45	Mexican	30
Best & Belcher	60	Mollie Gibson	19
Brunswick	05	Ontario	4 50
Bulwer	—	Ophir	—
Crown Point	65	Paramount	10
Crown Cal. & V. A.	—	Plymouth	—
Cripple Creek Con	08 1/2	Quicksilver	3 00
Deadwood	—	Quicksilver pfd.	11 00
Favorite	11 25	Sierra Nevada	—
Fortuna	04	Standard	1 60
Golden Fleece	45	Union Con	—
Gould & Curry	45	Yellow Jacket	—
Hale & Norcross	—		

## COLORADO SPRINGS STOCKS

Alamo	03 1/4	Isabella	30
Anaconda	48	Iowa	—
Argentum Juanita	20 1/2	Jack Pot	05 1/2
Banana	04 1/2	—	06 1/2
Bon. Hur.	02 1/2	Mollie Gibson	23
C. K. & N.	00 1/2	Mount Rosa	—
C. C. & Manitou	02	Pharmacist	09 1/2
Creede & C. C.	—	Portland	70
C. K. Consolidated	09	Peoples	02 1/2
Garfield Grouse	04	Sacramento	02
Golden Fleece	30	Star of the West	—
Gold & Globe	—	Union Gold	22
Gold Standard	03 1/2	Virginia M.	02 1/2
Inslay	300	Work	05
Ironclad	04 1/2		

## LOS ANGELES, CAL.

Brown Dako	—	Maganetta	03 1/2
Calif. Cons.	002	New York Action	01 1/2
East Armagosa	008	Old Dominion	01 1/2
Gold Bug	008	Pacific Con	02 1/2
Laguna	5 00	Rand Mt	—
Lucky Star	7 60	Wedge	02 1/2

## SAN FRANCISCO.

Alpha	—	Exchequer	—
Alta Con	10	Gould & Curry	24
Andes	24	Hale & Norcross	1 55
Belcher	23	Justice	55
Best & Belcher	35	Mexican	38
Bodie	10	Ophir	80
Bullion	10	Oregon	—
Challenge	26	Potosi	46
Chollar	50	Savage	28
Confidence	85	Sierra Nevada	67
Con. Cal. & Va.	1 0	Union Con	—
Crown Point	17	Yellow Jacket	03

## SALT LAKE CITY

Alice	25	Little Pittsburg	01 1/2
Ajax	25	Lower Mam	40
Alliance	15	Lucky Bill	—
Anchor	70	Malvern	—
Bogart	—	Mammoth	2 05
Buckeye	02	Maxfield	—
Bull, Beck	3 85	Mercur	8 10
Cent. Eureka	20 00	Morgan	12 1/2
Chloride Point	35	Northern Light	50
Dalton	70	Ontario	15
Daly	85	Ontario	4 00
Dalton West	3 25	Overland	—
Dalton & Lark	07 1/2	Richmond Ana.	—
Dexter	1 40	onda	01 1/2
Eagle	02	Rover	20
East Golden Gate	—	Sacramento	—
Eureka Hill	—	Silver King	15 00
Four Aces	01 1/2	Sioux Con	—
Galena	65	Sunbeam	02
Gemini	—	Sunshine	20
Geyser-Marion	1 10	Swansea	1 80
Grand Central	60	So Swanska	1 27 1/2
Homestake	00 1/2	Utah Con	—
Horn Silver	1 50	Utah Con	70

## ROSSLAND, BRITISH COLUMBIA.

Alberta	05	Josie Mac	12 1/2
B. C. Gold King	07	Josie	38
Beaver	10	Jumbo	75
Big Three	10	Knight Templar	05
Bluebird	07	Kootenay-London	10
Bruce	10	Le Roy	8 00
Butte	01 1/2	May	18
Caledonia Con	05 1/2	Mayflower	15
Colonia	15	Monte Christo	19 1/2
Compania	15	Monte	15
Deer Park	24	Mugwump	03
Della Coila	12 1/2	Nest Egg	05
Delaware	02	Novelty	08
Eastern Star	20	O. K.	10
Enterprise	20	Palo Alto	03
Erie	03 1/2	Phoenix	13 1/2
Eureka Con	08 1/2	Portrait Lee	15
El Dorado Star	05 1/2	Red Eagle	15
Georgia	10 1/2	Red Mount, View	06
Gertrude	10 1/2	Red Point	10
Golden Gripe	15	Rossill'd H'mest'ke	10
Good Hope	03 1/2	Rossill, Red Mt.	08
Grand Price	03 1/2	St. Elmo	20
Great Western	08	St. Paul	12 1/2
Hattie Brown	—	Silver Bell	04
Helen	04	Silverine	06
High Ore	04 1/2	So Cross & W. Con	—
Imperial	10	Virginia	12
Iron Horse	20	War Eagle Con	1 00
Iron Mask	28	West Le Roy	21
I. X. L.	10	White Bear	11

## DENVER STOCK REPORT.

Actua	00 3 1/4	Elikton	92
Alamo	02 1/2	Eureka	90
Anaconda	42	Garfield Grouse	94
Archilla	00 4	Golden Fleece	95
Argentum Jun.	01 1/4	Goldsmith	08 1/2
Ina	27	Gold Standard	02 1/2
Bangkok-C-Bell	02	Insley	00 3
Bankers	04	Iron Clad	02 1/2
Ben Hur	02 1/2	Isabella	28 1/2
Bol. Lee	04 1/2	Jack Pot	04 1/2
Boston & C. C.	01 1/2	Jefferson	08 1/2
Chimbarazo	00 2	Mollie Gibson	70
C. K. & N.	00 6	New Zealand	05 1/2
Colo. C. & M.	01 1/2	People's	01 1/2
C. C. Con	06 1/2	Pharmacist	08 1/2

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Am Den & M Co.	1 00	Helena & Frisco	8 00
Bald Butte	2 50	Iron Mountain	—

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Amistad y Concordia	"	24
Guajinuato	Guajinuato	710
Arevalo y Anexas	Hidalgo	200
Zacatecas	Zacatecas	210
Barradon y Cabras	Durango	300
Bartolome de Medina	Hidalgo	100
Cabezas y An.	Zacatecas	30
Candelaria de Pinos	"	160
Candelaria de Chalchihuitán	"	20
Capuazoya	Durango	120
Carmen	Hidalgo	350
Chapultepec	"	90
Guajinuato	Guajinuato	650
Castellana y San Ram	Cerro Colorado	250
Cinco Señores y An.	Cinco Señores y Anexas	8. Luis Potosi
Cooperacion y Anexas	"	1,300
Eli Oro	Guajinuato	40
Espana y An.	Espana y An.	5
Purisima de los Com	Real del Monte	900
Real del Monte	Hidalgo	800
Refugio y Va	Durango	60
Restauradora	"	50
Rosario y Anexas	Hidalgo	270
San Francisco	"	100
S. Luis Potosi	Hidalgo	925
S. Luis Potosi	Hidalgo	400
S. Pedro	Hidalgo	20
S. Pedro	S. Luis Potosi	730
S. Pedro	Durango	80
Sirena	Hidalgo	400
Soledad	Hidalgo	250
Sorpresas	"	250
Trinidad	Guajinuato	40
Tlauzingo	Puebla	27
Union	Hidalgo	260
Zaragoza	"	15
Zomelchuan (gold)	Vera Cruz	100
Zona Min de Pozos	Guajinuato	15

NOTE.—The above Mexican stocks are figured on the basis of Mexican silver

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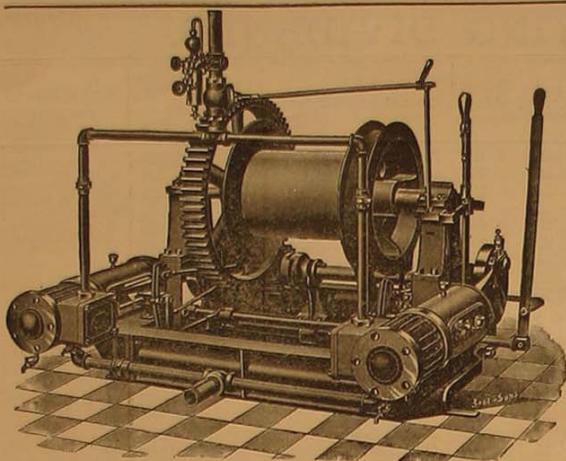
## WRECKING PUMP AND STEAM ENGINE FOR

730 FOOT LIFT.

## Compound Pump 200 foot lift for Hydraulic Mining

## INCORPORATED MINES PAYING DIVIDENDS.

NAMES OF MINES	LOCATION	No. of Shares	Capital Stock	Par Value	Amount of last Dividend	Date of Last Dividend	Total Amount Paid in Dividends	Kind of Mineral Produced
Aetna Cons.	California	100,000	\$ 500,000	\$ 5	\$ 10	Sept 1897	\$ 110,000	Q.
Adams	Colorado	150,000	1,500,000	10	.04	October 1895	693,500	S, L, C.
Alaska, Treadwell	Alaska	200,000	5,000,000	25	35 $\frac{1}{2}$	October, 1897	3,250,000	G.
Alaska Mexican	Alaska	200,000	1,000,000	5	.10	Oct., 1897	297,031	G.
Alice	Montana	400,000	10,000,000	25	.03	Oct 1897	1,055,000	G. S.
Anaconda	Montana	1,200,000	30,000,000	25	1 25	May 1897	3,750,000	C.
Anchoria Leland	Colorado	600,000	600,000	1	.01	Oct 1897	84,000	G.
American Gold	Colorado	300,000	3,000,000	10	.02	Aug 1897	273,000	G. S. L
Atlantic	Michigan	40,000	1,000,000	25	1 00	Feb. 1897	740,000	C.
Bald Butte	Montana	250,000	250,000	1	.03	Sept 1897	512,500	G. S.
Bangkok C-Bell	Colorado	600,000	600,000	1	.01	July 1896	107,510	S. L. C.
Bir Six	Colorado	500,000	500,000	1	00 $\frac{1}{2}$	April 1897	5,000	G. S.
Boston & Montana	Montana	150,000	3,750,000	25	3 00	Aug 1897	6,275,000	G. C. S.
Bullion Beck and Champion	Utah	100,000	1,000,000	10	.50	Mar 1897	2,465,000	G. S.
Bunker Hill and S.	Idaho	300,000	3,000,000	10	.05	Oct 1897	324,000	S. L.
Cariboo	British Col.	800,000	800,000	1	.02	May 1897	156,965	G.
C. O. D.	Colorado	500,000	500,000	1	.01	March 1896	25,000	G.
Calumet & Hecla	Michigan	10,000	2,500,000	25	10 00	Oct. 1897	50,850,000	C.
Centennial Eureka	Utah	30,000	1,500,000	50	1 00	Mar 1897	2,010,000	S. L.
Central Lead	Missouri	4,000	400,000	100	1 00	Oct 1897	18,000	L.
Charleston	South Car.	10,000	1,000,000	100	1 00	Feb 1897	150,000	.....
Champion	California	34,000	340,000	10	.25	Aug 1897	273,200	G.
Consolidated, California and Virginia	Nevada	216,000	21,600,000	100	.25	March 1895	3,592,800	G. S.
Copper Queen Consolidated	Arizona	200,000	2,000,000	10	.25	June 1895	1,910,000	C.
Crescent	Utah	24,000	600,000	25	.....	July 1897	280,000	.....
Daly	Utah	150,000	3,000,000	20	.25	Mar 1897	2,925,000	S. L.
Deadwood Terra	Dakota	200,000	5,000,000	25	.40	June 1897	1,320,000	G.
De Lamar	Idaho	400,000	2,000,000	5	.25	Jan 1897	2,250,100	S. L.
Della S.	Colorado	1,000,000	1,000,000	1	.10	Jan 1897	60,000	G.
Doe Run	Missouri	5,000	500,000	100	.50	October 1897	.....	L.
Dalton and Lark	Utah	2,500,000	2,500,000	1	00 $\frac{1}{2}$	August 1896	87,500	S. L.
Elkton Consolidated	Colorado	1,250,000	1,250,000	1	.03	Sept 1897	361,960	G. S.
El Paso	Colorado	650,000	650,000	1	.01	Aug 1897	5,393	G. S.
Florence	Montana	500,000	2,500,000	5	.01	May 1897	132,530	S.
Galena	Utah	100,000	1,000,000	10	.05	Jan. 1897	71,000	G. S. L.
Garfield Grouse	Colorado	1,200,000	1,200,000	1	.01	Feb. 1897	24,000	G.
Geyser-Marion	Utah	300,000	1,500,000	5	.03	Nov 1897	54,000	G.
Golden Eagle	Colorado	1,000,000	1,000,000	1	.01	Sep. 1896	10,000	G.
Golden Fleece	Colorado	600,000	600,000	1	.01	Feb. 1897	569,179	G. S.
Gold Coin	Colorado	200,000	1,000,000	5	.05	Aug 1897	150,000	G. S.
Gold and Globe	Colorado	750,000	750,000	1	3-10	July 1897	51,625	G.
Hecla Consolidated	Montana	30,000	1,500,000	50	.50	Feb. 1897	2,175,000	S. G. L. C.
Helena & Frisco	Idaho	500,000	2,500,000	5	.04	August 1896	475,000	S. L.
Highland	S. Dakota	100,000	10,000,000	100	.20	Oct 1897	3,424,918	G.
Holy Terror	S. Dakota	300,000	300,000	1	.03	Sept 1897	18,000	G.
Homestake	Dakota	125,000	12,500,000	100	.25	Oct. 1897	6,431,250	G.
Hope	Montana	100,000	1,000,000	10	.10	Nov 1897	732,252	S.
Horn Silver	Utah	400,000	10,000,000	25	12 $\frac{1}{2}$	January 1896	5,080,000	S. L.
Idaho	Brit. Col.	500,000	500,000	1	.05	Mar 1887	152,000	.....
Iowa	Colorado	1,000,000	1,000,000	1	00 $\frac{1}{2}$	Oct 1897	65,000	G.
Iron Mountain	Montana	500,000	5,000,000	10	.01	Sept 1897	497,500	S.
Isabella	Colorado	2,250,000	225,000	100	00 $\frac{1}{2}$	June 1897	270,000	G.
Kearsarge	Michigan	40,000	1,000,000	25	.10	Aug 1897	160,000	C.
Last Chance	Brit. Col.	500,000	500,000	1	.04	Jan 1897	42,000	S. L.
Le Roi	British Col.	500,000	2,500,000	5	.10	Oct 1897	625,000	G.
Minnesota	Minnesota	165,000	16,500,000	100	1 50	July 1896	3,240,000	I.
Montana Ore Purchasing	Montana	40,000	1,000,000	25	.01	October 1897	640,000	.....
Moose	Colorado	600,000	600,000	1	.01	January 1896	186,000	G.
Morning Star	California	2,400	240,000	100	8 00	Sept. 1897	553,600	G.
Mt. Rosa	Colorado	1,000,000	1,000,000	1	00 $\frac{1}{2}$	Oct. 1896	30,000	G.
Mercur	Utah	200,000	5,000,000	25	12 $\frac{1}{2}$	Oct 1897	825,000	G.
Mammoth	Utah	400,000	10,000,000	25	.05	Nov. 1896	1,150,000	G. S. O.
Moon Anchor Gold	Colorado	600,000	600,000	1	02 $\frac{1}{2}$	Nov 1897	63,000	G.
New Elkhorn	Colorado	300,000	1,500,000	5	.24	Sep. 1896	72,000	G.
New York & Hon. Rosario	Central A.	150,000	1,500,000	10	.10	Oct. 1897	832,500	S. G.
Napa	California	100,000	700,000	7	.20	Oct 1897	870,000	Q.
New Idria Quicksilver	California	100,000	500,000	5	.10	Sept 1897	20,000	Q.
Ontario	Utah	150,000	15,000,000	100	.10	June 1897	13,445,000	S. L.
Osceola	Michigan	50,000	1,250,000	25	1 00	June 1897	2,172,500	C.
Parrot	Montana	230,000	2,300,000	10	.06	June 1897	1,656,122	C.
Pennsylvania Consolidated	California	51,500	5,150,000	10	.05	Sept 1897	20,750	.....
Portland	Colorado	3,000,000	3,000,000	1	.01	Oct 1897	1,183,000	G. S.
Princess	Colorado	1,000,000	1,000,000	1	00 $\frac{1}{2}$	Feb 1897	45,000	G.
Quincy	Idaho	100,000	2,500,000	25	4 00	August 1897	9,470,000	C.
Rambler-Cariboo	Brit. Col.	1,000,000	1,000,000	1	.02	April 1897	40,000	.....
Reco	Brit. Col.	1,000,000	1,000,000	1	.50	May 1897	187,500	S. L.
Sacramento	Utah	1,000,000	5,000,000	5	00 $\frac{1}{2}$	March 1897	22,000	G.
Small Hopes Consolidated	Colorado	250,000	5,000,000	20	.10	Mar 1896	3,275,000	S.
South Swansea	Utah	150,000	150,000	1	.05	Oct 1897	59,900	S. L.
Standard	California	200,000	20,000,000	100	.10	Sept 1897	3,757,888	G. S.
St. Joseph	Missouri	250,000	2,500,000	10	.15	Oct 1897	24,000	L.
Silver King	Utah	150,000	3,000,000	.20	.25	October 1897	1,237,500	S. L. G.
Slocan Star	Brit. Col.	2,000,000	1,000,000	0.50	.05	Mar 1897	350,000	.....
Smuggler Union	Colorado	50,000	5,000,000	100	1.00	Oct 1896	150,000	G. S.
Swansea	Utah	100,000	500,000	5	.05	Oct 1897	61,500	S. L.
Tom Boy	Colorado	200,000	2,000,000	10	.20	March 1896	410,000	G.
Tamarack	Michigan	60,000	1,500,000	15	3 00	June 1897	4,950,000	C.
Union	Colorado	1,250,000	1,250,000	1	.01	June 1896	73,000	S.
United Verde	Arizona	300,000	3,000,000	10	.25	December 1893	562,500	C.
Utah	Utah	100,000	1,000,000	20	.02	Feb. 1897	175,000	G. S.
Utah Consolidated	Utah	30,000	150,000	5	.02	Sept. 1897	3,000	S. L.
Victor	Colorado	200,000	1,000,000	5	.10	March 1897	765,000	G.
Western Mine Enterprise	Montana	500,000	500,000	1	.10	Mar 1897	12,000	.....
War Eagle	British Col.	500,000	500,000	1	.06	October 1896	187,000	.....



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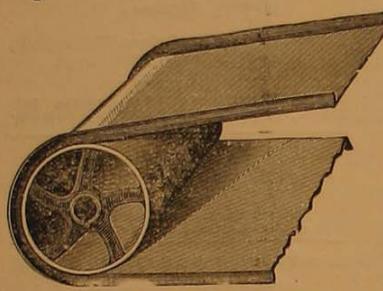
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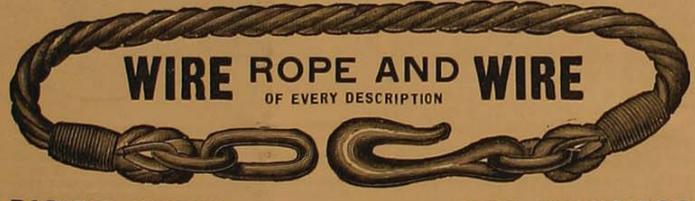


This illustration shows the edge flanging outwardly as it passes over the pulley. This relieves the strain from the top and bottom of the edge by directing the strain automatically to the inside face of the edge. Therefore all belts have been so constructed that when they pass over the pulleys or rolls, a direct strain comes upon the top or at the base of the edges, causing the edges to break away from the body of the belts in a very short time. *We avoid this Mechanical Defect by our Spadone Curved Edge.* Belts made to fit any machine—4, 5 and 6 feet wide. Prices and samples on application.

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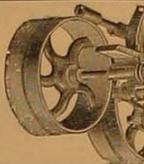
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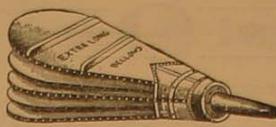
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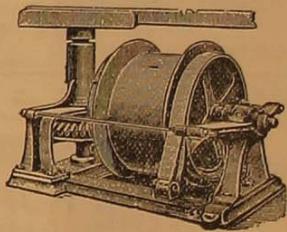
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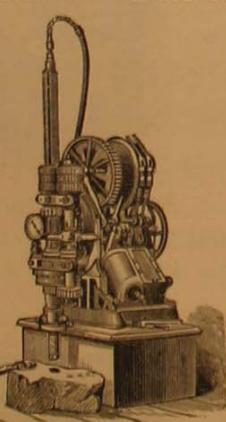
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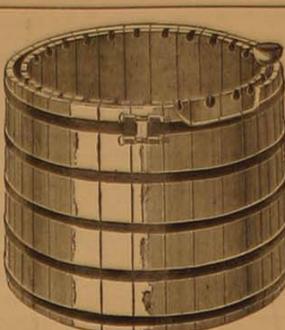
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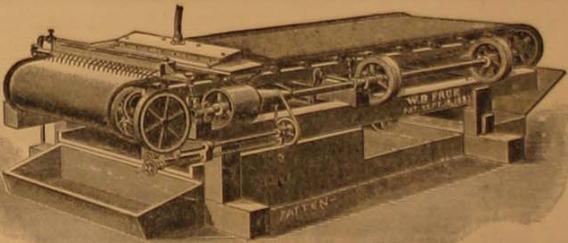
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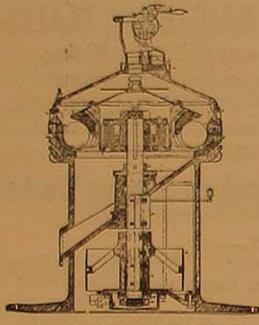
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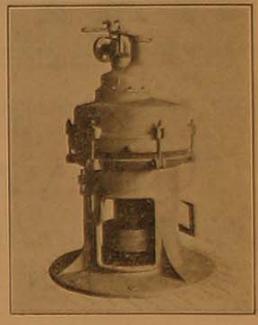
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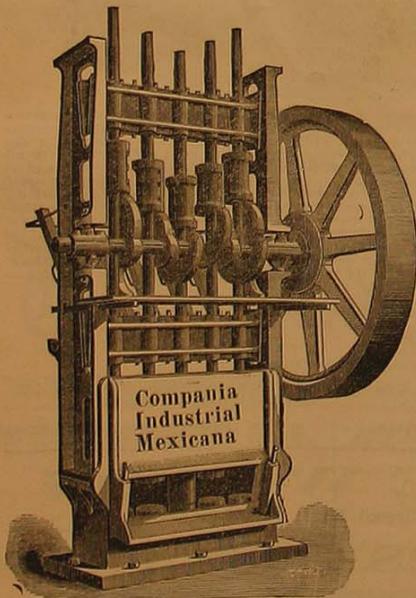
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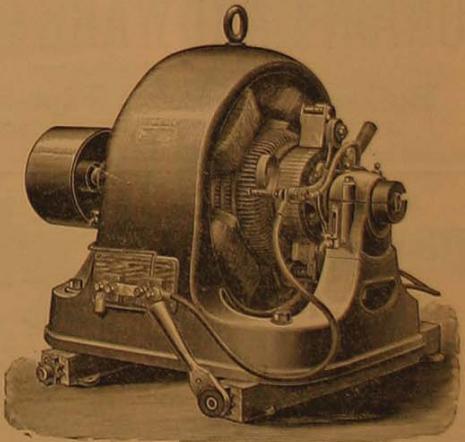
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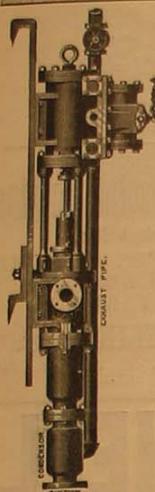


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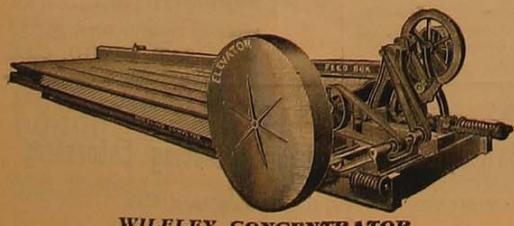
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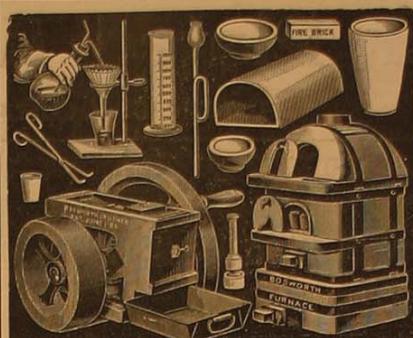
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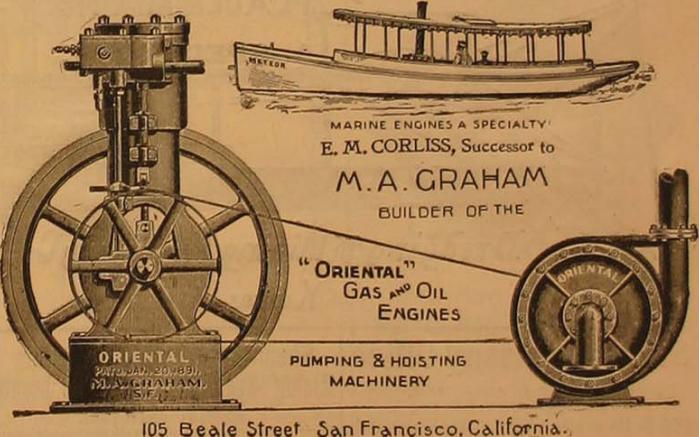
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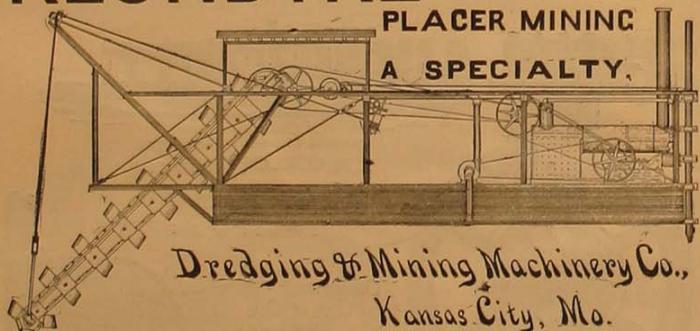
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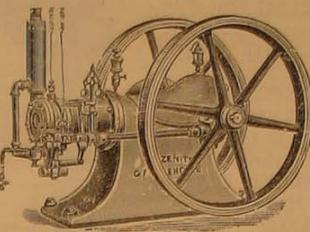
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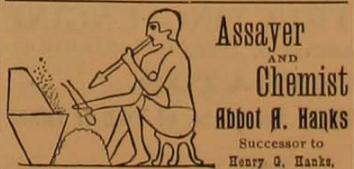
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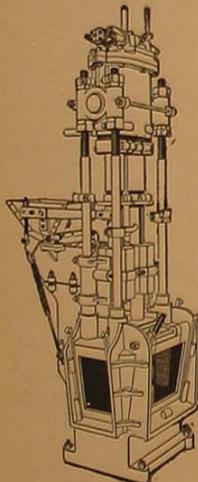
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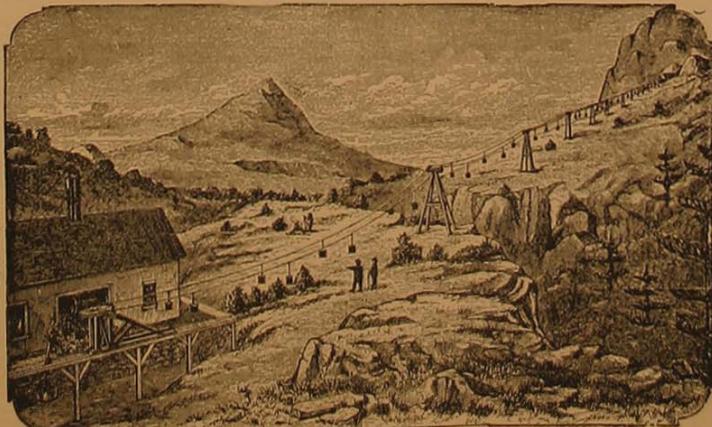
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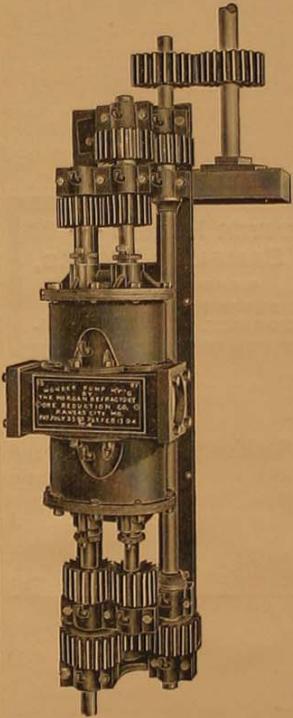
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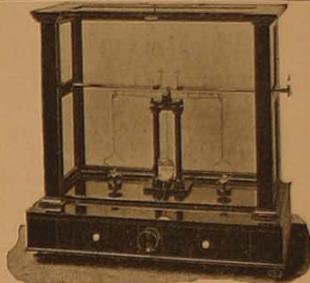


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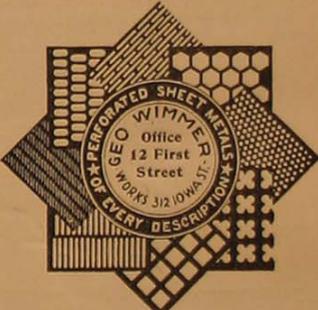
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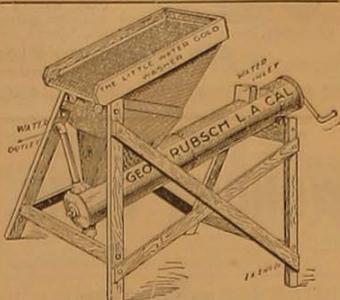
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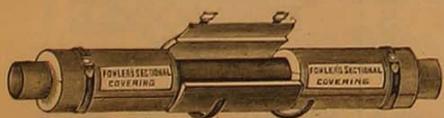
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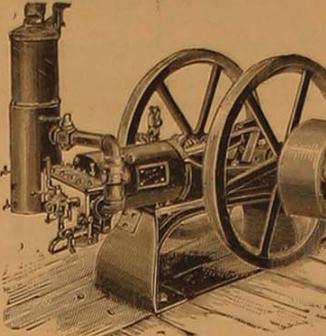
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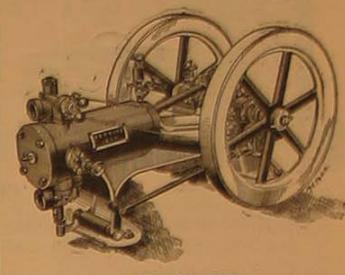
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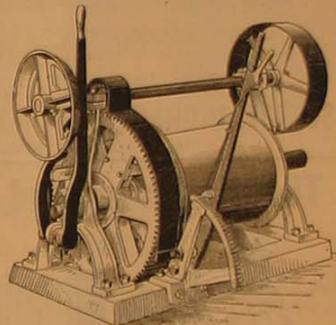
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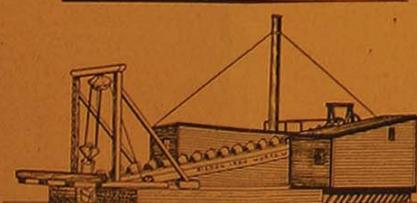
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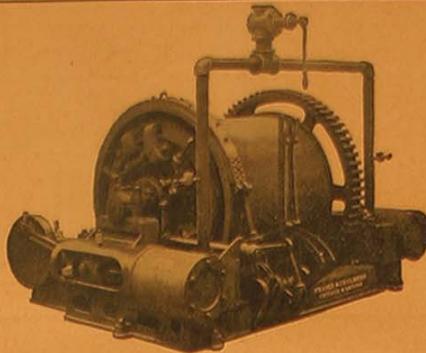
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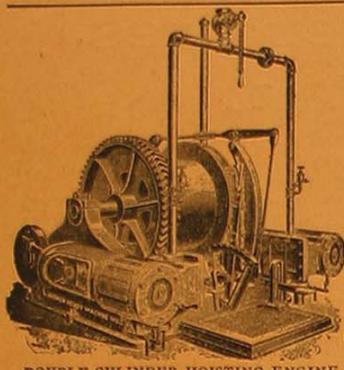
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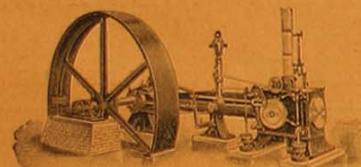
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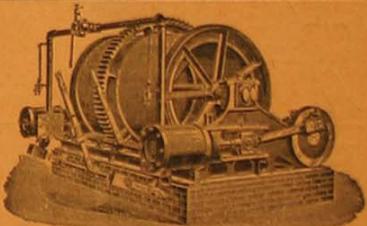
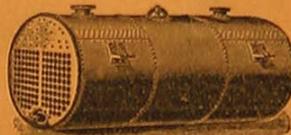
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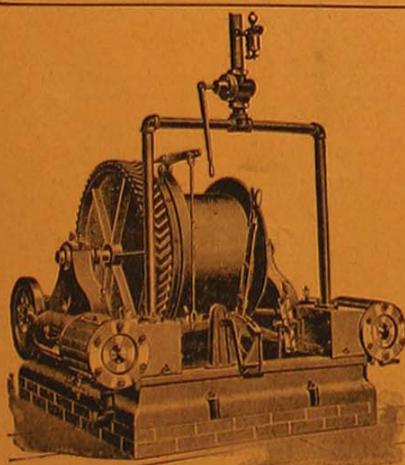
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